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**TAX ANALYSIS OF DEDUCTIONS CLAIMED UNDER THE INCOME TAX ACT, 1961 FROM SALARY INCOME BY THE TEACHERS OF MUMBAI**

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**<sup>1</sup>Nikita Manjrekar and <sup>2</sup>Dr. Pushpkant Shakdwipee**<sup>1</sup>Research Scholar, Department of Commerce, Pacific University, Udaipur, Rajasthan, India<sup>2</sup>Associate Professor, Pacific Institute of Management, Pacific University, Udaipur, Rajasthan, India**ABSTRACT**

*Income Tax Act of 1961, have provided additional benefits to the salaried individuals with respect of increasing their avenues of tax deductions measures. The main objectives of this paper is to study deductions options available for income tax and to analyze awareness level regarding different deductions options available to permanent teacher of south Mumbai. Total 101 Respondents were studied for that.*

*Keywords: Income Tax, Deduction in Tax,*

**1. INTRODUCTION**

Planning is very important aspect of any field. Particularly, this has its own relevance in the modern day world. Tax planning is very essential form of avoiding unnecessary burden, which can put pressure on income and investments. It is very important, that the individuals need to implement effective tax strategies to make more of investments by saving planning on expenditures. Income Tax Act of 1961, have provided additional benefits to the salaried individuals with respect of increasing their avenues of tax deductions measures. There are provisions granted in this law, which deal with tax laws. Tax credits are also granted to individuals having fixed salaries as well as those engaged in informal sectors of the economy.

Tax planning is often related directly or indirectly to financial planning. This is because the taxes put so much pressure on the available financial sources of the savings, at times, drain out. Even the and successful elides of the society are hit heavily by tax pressure. Thus, it is said that for the financial planning process primary step is to plan out taxes in an effective manner. Tax efficiency will automatically be installed in the system if tax planning coincides well with financial planning.

Tax planning is nothing but a major which helps in synchronizing various financial parameters including exemptions, all the rebates and exemptions and deductions in an effective manner. This will ultimately help in putting check on the tax liability induced by the government.

Practically speaking, taxation law needs to be really worked out to manage the financial resources. Payment of various types of taxes ultimately reduces the disposable income of the individuals putting pressure on them. Does there of allies and dilemma within an individual on the situation whether he has to satisfy with whatever is left Behind after paying the taxes or whether he has a chance to reduce the taxable amount by any sort. Tax planning is a responsibility of salaried individual which cannot be avoided.

The taxpayers need to have knowledge of tax laws. These are not the casual ones, but the in-depth judge made laws needs to be implemented while initiating any actions. For this the circulars of the Central Board of Direct taxes need to be timely studied by the individuals.

**2. OBJECTIVES OF THE STUDY**

The main objectives of the study are as follows –

- To study deductions options available for income tax to any assessee
- To analyze awareness level regarding different deductions options available to permanent teacher of south Mumbai.

**3. HYPOTHESIS OF THE STUDY**

Following are the hypothesis of the study-

H0: Permanent teachers of college of south Mumbai are aware of measures of tax planning

H1: Permanent teachers of college of south Mumbai are not aware of measures of tax planning

**4. RESEARCH METHODOLOGY**

For the present study both the primary and secondary data was used. Secondary data related to Income Tax Act of 1961 was used to highlight the features of the tax deduction, investments and savings options and measures available for tax planning. At the same time, literature on present topic was also reviewed which highlighted the general trend in the market in relation to tax planning and other parameters.

In order to fulfill the objectives set out, a sample study will be undertaken using a well – framed questionnaire, which was duly filled in by the respondents. Total 101 Respondents of varying nature were selected based on the important aspects such as their Age, Educational qualification, Occupation and so forth. A structured questionnaire was pretested and suitable modifications will be carried out later. Following is the analysis of the responses submitted by the respondents of the study.

## 5. LITERATURE REVIEW

- 5.1 **Anand et al.(2004)**, in their paper on "**Marketing of Financial Services: Strategic Issues**", studied the strategic issues relating to the marketing of financial services and concluded that today's financial services industry requires new strategies to survive and continue to operate. They have to adopt new marketing strategies and tactics which enable them to capture the maximum opportunities with the lowest risk in order to enable them to survive and meet the tough competition from global players of domestic and foreign origin.
- 5.2 **Rama Murthy et al. (2005)**, in their paper "**Recent Trends in Mutual Fund Industry**" has carried out a study to analyse the recent trends in mutual fund industry and concluded that the major benefits delivered to the small investors by mutual funds are professional management, diversification of investment, convenient administration, return potential, liquidity, transparency, flexibility, affordability, wide choice and proper regulation. They also analysed certain recent trends in mutual fund industry such as entry and exit of mutual fund companies, compulsory certification of mutual fund sales/marketing personnel, mutual fund schemes related to real estate, commodity, bullion and precious metals etc.; shift from income funds to money market funds, shift from banks to mutual funds and buying and selling of mutual funds online.
- 5.3 **Das, B., Mohanty, S. and Shil, N.C. (2008)**, in their paper on "**Mutual Fund vs. Life Insurance: Behavioural Analysis of Retail Investors**", studied the comparative behaviour of investors for mutual funds and life insurance. They found that the existing 'Behavioural Finance' studies on factors influencing selection of mutual fund and life insurance schemes are very few and very little information is available about investor perceptions, preferences, attitudes and behaviour. Finally, the study concluded that lower and middle income group investors invest more in mutual fund and life insurance as compared to upper income group investors.
- 5.4 **Desigan Gnana, Kalaiselvi S. & Anusuya L., (April 2006)**, in their paper on "**Women Investors' Perception towards Investment -- An Empirical Study**", studied that the women investors' perception towards investment in general and found that women investor's generally hesitate in investing in mutual funds due to their lack of knowledge regarding investment protection, procedure of making investment, market fluctuations, risk associated with investment, valuation of investment and redressal of grievances regarding their investment related problems.
- 5.5 **Kalyani (1992)**, in her paper on "**A Study of Tax Planning of Salaried Employees in Coimbatore City**", has carried about her study in Coimbatore City android Employees with regards to tax planning for 1988 - 89. According to her study higher tax liabilities are paid by the elder people who are earning for a longer time. It was also noted that the Government employees have less salary as compared to the private sector employees. Does the tax payment will be higher for the private sector employees. These taxes could be reduced significantly by increasing the investments in mutual funds, life insurance policies as well as national share certificates.
- 5.6 **Kennedy and Henry, A. (1992)**, **Publisher: The Canadian Institute of Chartered Accountants Publication Name: CA Magazine, Subject: Business, ISSN: 0317-6878**, in the study mentions that the components of Income Tax Act of 1961 are not at all difficult in understanding and implementing. Initially for a new taxpayer it is difficult in how the taxes are levied, tax rates and tax base and when the taxes have to be paid. The tax payer understands components easy to manage the investments and savings. All the approaches with regards to tax compliance need to be implemented with a suitable methodological approach.
- 5.7 **Lewis, A (1982)**, in his paper "**The Psychology of Taxation**", has carried out research in his paper on psychology of taxation when he has started on tax awareness and approaches of the individual in filing the tax returns. I believe that if people become more aware of the taxation policies and procedures, the tax compliance would also simultaneously increase. The founder of the people is not having sufficient knowledge neither on tax policies nor on the advantages that could be gained by effective tax planning.

**6 Deductions from Salary Under Income tax act of 1961**

Income Tax Act, 1961, provides various types of deductions and allowances to the employees from time to time. Income chargeable under the head "Salaries" shall be computed after allowing these deductions. A scientific tax planning will be of much helpful to the employees in availing of these benefits to the maximum possible extent and thereby reducing the incidence of tax. A brief discussion about the deductions available under Section 16, Section 24, Chapter VI – A and relief of tax under Section 89 of the Income Tax Act is made here in.

**6.1 Deduction under Section 16**

Standard deduction under Section 16 (i) was available to all employees up to Assessment Year 2005-06. This deduction has been withdrawn w.e.f. AY 2006-07. At present there are two deductions available under Section 16. They are entertainment allowance under Section 16 (ii) and tax on employment under Section 16 (iii)

**6.2 Entertainment Allowance – Section 16 (ii)**

This deduction is allowed only to Government employees. Non-Government employees shall not be eligible for any deduction on account of any entertainment allowance received by them. In the case of entertainment allowance, the assessee is not entitled to any exemption but he is entitled to a deduction under Section 16(ii) from gross salary. Therefore, the entire entertainment allowance received by an employee is added in computation of the gross salary. The Government employee is then, entitled to deduction from gross salary on account of such entertainment allowance to the extent of minimum of the following three limits.

- a. Actual entertainment allowance received during the previous year.
- b. Twenty percent of his salary exclusive of any allowance, benefit or other perquisite.
- c. Rs. 5000/-

**6.3 Tax on Employment – Section 16 (iii)**

As per the Constitution of India, the State Government or Local Authorities are empowered to make law and to collect taxes on professions. However, the total amount payable in respect of any one person shall not exceed Rs. 2500/- per annum. As per Section 16 (iii), any sum paid by the assessee on account of tax on employment shall be allowed as a deduction in the year in which the tax is actually paid.

**6.4 Deduction in Respect of Interest on Housing Loan (Section 24B)**

Loss under the head "Income from House Property" being interest on house loan may be claimed as a deduction under Section 24B of the Income Tax Act. It allows an assessee to deduct interest payable on the borrowed capital of self occupied house property, where such property has been acquired, constructed, repaired, renewed or reconstructed with borrowed capital. The amount of interest payable yearly should be calculated separately and claimed as a deduction every year. It is immaterial whether the interest has been actually paid or not paid during the year. The maximum amount of interest eligible for such deduction is Rs. 30,000/- for housing loan taken for construction or acquisition of residential building upto 31<sup>st</sup> March, 1999. Where the property is acquired or construction is completed within three years of the end of the financial year in which the capital was borrowed, actual interest payable subject to a maximum of Rs. 1,50,000 is allowed as deduction. The higher rate is not allowed for loans taken for repairs/ renovation.

**6.5 Deductions under Chapter VI – A**

In computing the total income of an assessee, certain deductions are permissible under Chapter VI A of the Income Tax Act, from the gross total income. These deductions are available in the form of tax free investments and deductions in respect of certain expenditures incurred by the assessee towards medical treatment, higher education etc for the relevant financial year. They include deductions under Section 80C to 80U of the Act. Section 80C covers deductions on account of payments and or investments made in specified investment avenues. Section 80CCC and 80CCD cover contribution towards approved pension funds. The aggregate of deductions under Section 80C, 80CCC and 80CCD shall not exceed Rs. 1 lakh.

**7 Relief of Tax Under Section 89 of the Act**

If an assessee receives during the previous year any sum as advance salary or as arrear salary in respect of the years preceding the previous year or any other payment from the employer in relation to past services, his tax liability is bound to increase as a result of increase in the taxable income. If it is possible to add such arrear or advance salary to the income of respective years to which they related, the tax liability of the assessee in respect of the income of the previous year will be reduced considerably. Under Section 89 of the Income Tax Act, relief will be granted to such assessee. The assessee may apply for grant of relief under Section 89 (1) in relation to the following taxable amounts.

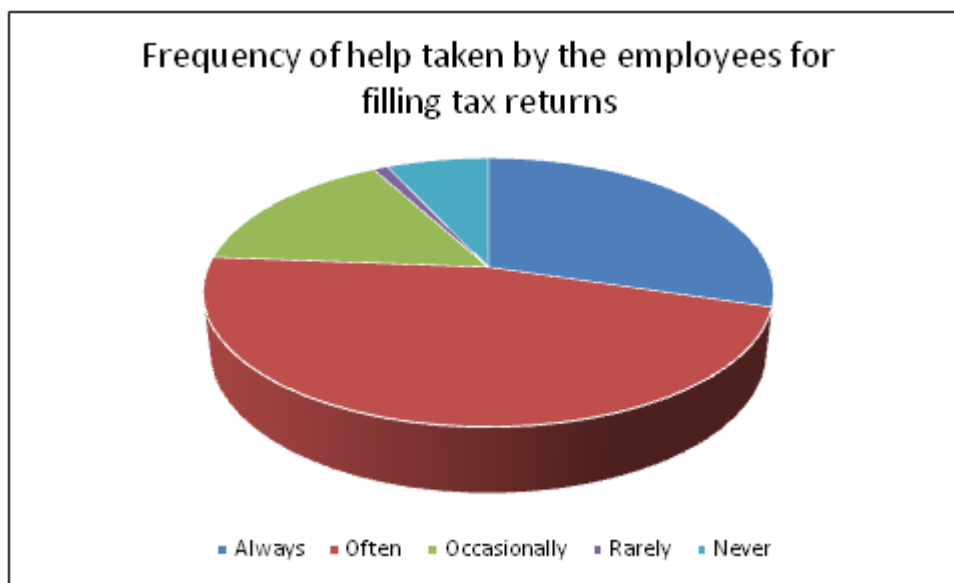


- a. Advance of salary
- b. Arrear of salary
- c. Gratuity – Section 10 (10)
- d. Commutatin of Pension – Section 10 (10A)
- e. Encashment of earned leave – Section 10 (10AA)
- f. Retrenchment compensation – Section 10 (10B)
- g. Profits in lieu of salary – Section 17 (3)
- h. Unrecognised Provident Fund.

No relief shall be granted in respect of any amount received or received by an assessee on his voluntary retirement or termination of his service, if an exemption in respect of which has been claimed by the assessee under section 10(10C) in respect of such, or any other, assessment year.

## 8 Data Analysis and Interpretation

<b>Table : Frequency of help taken by the employees for filling tax returns</b>		
Category	Responses	Percentage
Always	30	29.70
Often	47	46.53
Occasionally	16	15.84
Rarely	1	0.99
Never	7	6.93
Total	101	100.00



**Fig 1:** Graph showing the help taken by the employees of the professionals for filling tax returns

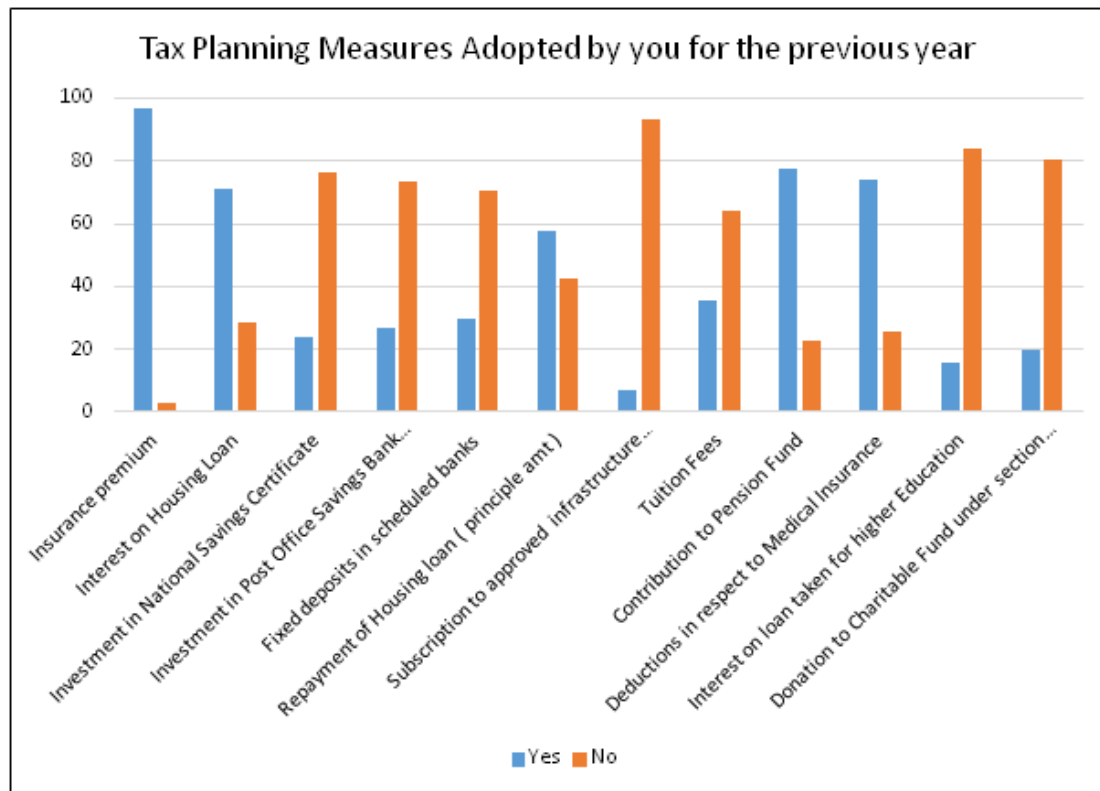
Table and figure highlights the sources of Frequency of help taken by the respondents (tax payers) for filling tax returns. Nearly 46.53 percent of the respondents prefer to take help of the tax consultants often, 30 percent take it always, 16 percent take it occasionally, 7 percent take it never and 1 percent takes it rarely.

<b>Table 2: Awareness regarding the various deductions under the Income Tax</b>			
	Fully Aware	Partly Aware	Unaware
Insurance premium	86	12	3
Percentage	85.15	11.88	2.97
Interest on Housing Loan	60	40	1
Percentage	59.41	39.60	0.99
Investment in National Savings Certificate	31	56	14
Percentage	30.69	55.45	13.86
Investment in Post Office Savings Bank Deposits	29	40	32

Percentage	28.71	39.60	31.68
Fixed deposits in scheduled banks	41	48	12
Percentage	40.59	47.52	11.88
Repayment of Housing loan ( principle amount )	52	44	5
Percentage	51.49	43.56	4.95
Subscription to approved infrastructure bonds	15	33	53
Percentage	14.85	32.67	52.48
Tuition Fees	40	52	9
Percentage	39.60	51.49	8.91
Contribution to Pension Fund	70	20	11
Percentage	69.31	19.80	10.89
Deductions in respect to Medical Insurance	77	20	4
Percentage	76.24	19.80	3.96
Interest on loan taken for higher Education	27	42	32
Percentage	26.73	41.58	31.68
Donation to Charitable Fund under section 80/G	21	26	54
Percentage	20.79	25.74	53.47

Table 2 and figure 2 highlights the awareness of the tax payers of the awareness regarding the various deductions under the Income Tax Act. It is seen that more than 80 percent of the respondents are fully aware of the insurance premium as a measure for deducting Income Tax. Nearly 70 to 80 percent people are aware of the contribution to pension fund and deductions in respect to medical insurance. Nearly 50 to 70 percent of the respondents are knowing about the Interest on housing loans and repayment of housing loans as a means of deductions on tax returns, and less than 50 percent people are aware of other means of tax deductions such as investment in National Savings Certificate, Investment in Post Office Savings Bank Deposits, Fixed deposits in scheduled banks, subscription to approved infrastructure bonds, tuition fees, Interest on loan taken for higher education and donation to charitable fund under sector 80/G. It is noted that the least known option of tax deductions by the respondents is subscription to approved infrastructure bonds.

<b>Table 3: Tax Planning Measures Adopted for the previous year</b>		
	<b>Yes</b>	<b>No</b>
Insurance premium	98	3
Percentage	97.03	2.97
Interest on Housing Loan	72	29
Percentage	71.29	28.71
Investment in National Savings Certificate	24	77
Percentage	23.76	76.24
Investment in Post Office Savings Bank Deposits	27	74
Percentage	26.73	73.27
Fixed deposits in scheduled banks	30	71
Percentage	29.70	70.30
Repayment of Housing loan ( principle amount )	58	43
Percentage	57.43	42.57
Subscription to approved infrastructure bonds	7	94
Percentage	6.93	93.07
Tuition Fees	36	65
Percentage	35.64	64.36
Contribution to Pension Fund	78	23
Percentage	77.23	22.77
Deductions in respect to Medical Insurance	75	26
Percentage	74.26	25.74
Interest on loan taken for higher Education	16	85
Percentage	15.84	84.16
Donation to Charitable Fund under section 80/G	20	81
Percentage	19.80	80.20

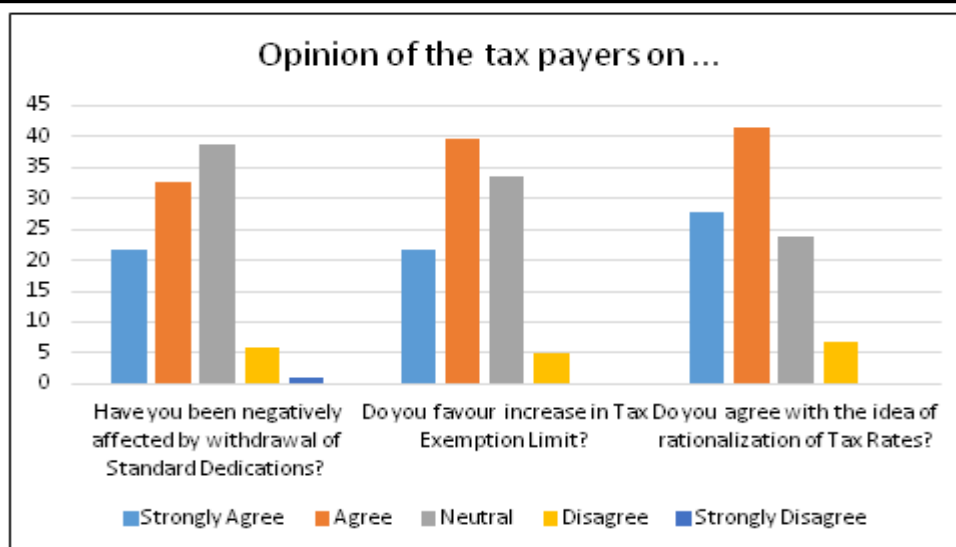


**Fig 3:** Graph showing the tax planning measures adopted by the employees in previous year (2018-19)

Table 3 and figure 3 focus on the tax planning measures adopted for the previous year by the tax payers (respondents). As this was multiple choice questions, where more than 1 response could be chosen by the people, the total percentage is going above 100 percent. It is seen that most of the respondents (97 percent) have adopted insurance premium as a measure for tax planning, whereas 77 percent respondents have chosen contribution to pension fund, 74.26 percent have chosen it as deductions in respect to medical insurance, 71.29 percent have found that interest on housing loan is the best tax planning measure, 57.43 percent said it as repayment of housing loan, and others have reported options such as investment in national saving certificate, investment in post office savings bank deposits, fixed deposits in scheduled banks, tuition fees, etc. It was seen that subscription to approved infrastructure bonds was not much chosen option for tax planning measure adopted by the respondents.

**Table 4:** Opinion of the tax payers

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Have you been negatively affected by withdrawal of Standard Deductions?	22	33	39	6	1
Percentage	21.78	32.67	38.61	5.94	0.99
Do you favour increase in Tax Exemption Limit?	22	40	34	5	0
Percentage	21.78	39.60	33.66	4.95	0.00
Do you agree with the idea of rationalization of Tax Rates?	28	42	24	7	0
Percentage	27.72	41.58	23.76	6.93	0.00

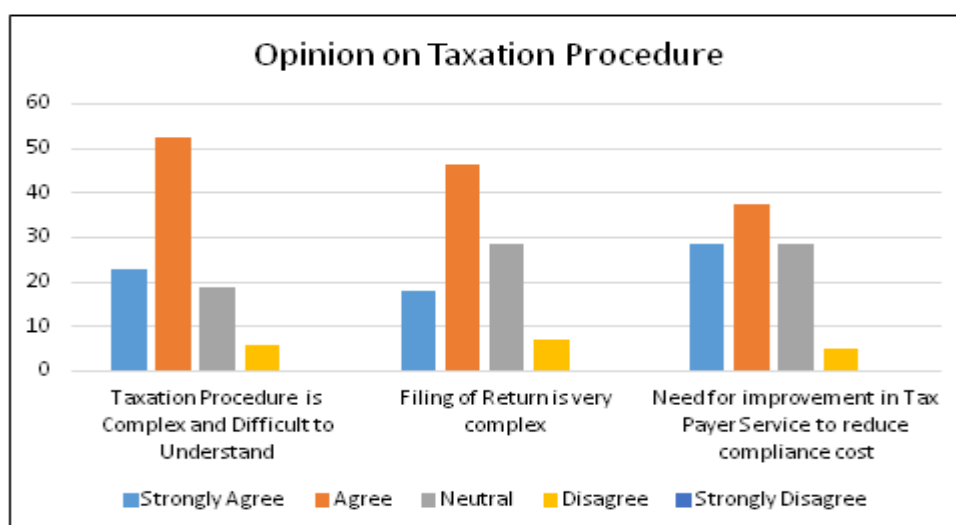


**Fig 4:** Graph showing the opinion of the tax payers on various aspects of taxation

Table 4 and figure 4 focuses on the opinion of the tax payers on various parameters related to tax compliance, exemptions and dedications. From the above table it was noted that more than 50 percent of the respondents agree to the fact that they have been negatively impacted by the withdrawal of Standard Dedications and 39 percent have opined that they have neither positive nor negative opinion on the same. Similarly more than 60 percent respondents have opined that they favour increase in tax exemption limit and more than 65 percent respondents agree with the idea of rationalization of tax rates.

**Table 5: Opinion on Taxation Procedure**

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Taxation Procedure is Complex and Difficult to Understand	23	53	19	6	0
Percentage	22.77	52.48	18.81	5.94	0.00
Filing of Return is very complex	18	47	29	7	0
Percentage	17.82	46.53	28.71	6.93	0.00
Need for improvement in Tax Payer Service to reduce compliance cost	29	38	29	5	0
Percentage	28.71	37.62	28.71	4.95	0.00



**Fig 5:** Graph showing the opinion of the tax payers on taxation procedure

Table 5 and figure 5 highlight on the opinion on taxation procedure where, nearly 76 percent respondents opine that they agree with the current taxation procedure, which is complex and difficult to understand, more than 65 percent respondents are of the opinion that filling tax return is very complex and nearly 67 percent respondents have agreed to the fact that there is need for improvement in tax payer service to reduce compliance cost.

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**9 CONCLUSION**

It was concluded from the overall study that the most adopted tax saving instrument is Provident Fund. Any individual who want to assessee income tax and want to do tax planning and savings, first calculate for total income then compute the income tax by deduction and adjustment in total income as per tax table structure. in the intrinsic value of the rupee, the fixed income groups are left with no choice but to forego a major part of the conveniences and benefits. Tax payers are mostly the full salaried people. There was no thought given by the researcher on the gender of the respondents, as the tax structure in India is not influenced by the gender of the respondents. . The main purpose behind this research is to understand whether they have any different tax planning and different ideas on the process of tax savings.

From the analysis of the data, it can be concluded that maximum respondents (70 percent) are belonging to the category, where the annual income ranges between Rs. 5,00,000/- to Rs. 8,00,000/- per annum. Nearly 43 percent of the employees have been filling the tax returns since last 11 to 15 years. Most of the tax payers are paying their taxes any time during the financial year. Nearly 21 percent of the respondents said that they do financial planning and tax filling at the beginning of the year, 16 percent noted that they do it at the end of the year. The most adopted tax saving instrument is Provident Fund, which got the first rank in this study. The second most adopted tax saving instrument is Life Insurance Policy. Further, the third choice is Housing Loan Interest and Payment of housing loan, the fourth choice is Children Tuition Fees. After that Fixed Deposit, National Pension Scheme, National Saving certificates, Health Insurance Plans, Donation and Equity Linked Saving Schemes respectively. Any individual who want to assessee income tax and want to do tax planning and savings, first calculate for total income then compute the income tax by deduction and adjustment in total income as per tax table structure. If tax is paid in access then get refund from the income tax department.

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**IMPACT OF COVID-19 ON HIGHER EDUCATION IN MAHARASHTRA**

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V.P. Varde College of Commerce & Economics, Mumbai, Maharashtra**ABSTRACT**

*Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, Hubei, China, and has resulted in an ongoing pandemic. The first case of the COVID-19 pandemic in the Indian state of Maharashtra was confirmed on 9 March 2020. The current pandemic is not only seen affecting the health of the citizens in the country but is also seen hindering various industries and shaking them to their roots. Education is likely to become the first casualty of the coronavirus crisis in economically weaker. The national lockdown and the increasing health crisis were effecting the education of the students as well, with their universities being shut and their syllabus stranded, until the industry decided to start a revolution instead. The world is facing the economic crisis and the second most area is affected is education system. In Maharashtra the number of cases have been increased and till date the cases are at the highest peak. The impact of lockdown in this article is mentioned about the issue future exams of schools and colleges of students, the exams have been cancelled in Maharashtra of higher education and traditional way of teaching is been changed to online education. Information is been provided in this article. The educational reform in India in the COVID-19 times seems to be a drastic step to adopt the changes. Allowing educational institutions to adopt online learning and start a virtual study culture, the pandemic is already shaking the sector forward with technological innovation and advancements.*

*Keywords: Covid-19, Lockdown, Higher Education, Impact, virtual.*

**INTRODUCTION**

Over past year the traditional education system is followed all over the world the classes conducted and exams conducted in the presence at class. Due to covid-19 everything has been changed worldwide, lockdown has been implemented all over the world. The world -started facing economic crisis due to lockdown the changes has been adopted all over the world in social life and also educational life. The Virus has changed the way of life of people and also change in education system . In other parts of country the part closure has been adopted by keeping the schools colleges and the crowded areas has been kept closed. In India the whole lockdown is implemented by applying the section 144 of IPC for some period when the infection was at the peak . Maharashtra is the most affected area due to coronavirus and the day to day increase in the number of patients has not stopped but the severness is reduced. Recently various firm decisions has been taken by the Maharashtra Government in educational system various changes implemented the exams have been cancelled of higher education and few paper of school board, the schools and college, and various hotels and halls are converted to quarantine centre due to lack of bed facilities. This caused the total shut down of schools and college to provide the facilitate and help the Government during the epidemic crisis. Various initiative have been taken by the Indian Government by implementing the Educational Channels, asking the schools and college to take online classes, to adopt the various digital learning methods which will be replacing the traditional teaching method. Skype call, Zoom application and other virtual options to reduce the distance in education and it is training students and teachers to use virtual classrooms and technology to provide the exchange of information. Undoubtedly, this is a very important time for students . The main objective of the scheme is to reduce the pressure on the students and help them to use their time in a beneficial way without compromising on quality education. There are various innovative changes in the student group in this Corona time, there are some negative issues, digital issues can create the mental health of the students, these issues the student walk anywhere learning, an issue that is mainly surveyed online and involves total hundred graduate and postgraduate students. Various surveys been conducted by the Government of India about educational system and how to make it work and implement during the period of lockdown.

**REVIEW OF LITERATURE**

**As per the WHO** it has stated that the virus is more dangerous and spread can be avoided by maintaining social distancing and lockdown due to which the school and college has been shut all over the world.

**According to a report of the Ministry of Human Resource Development, Government of India** conducted a survey on higher education and observed that there are 993 universities, 39931 Colleges and 10725 Stand Alone Institutions listed on their portal, which contribute to education. These institutions further reflect the

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student density of India as the total enrolments in higher education every year are nearly 37.4 million, reflecting the expanding horizons of the education industry.

**Problem of the Study**

India is an agricultural economy where major portion of the population depends on agricultural sector which also the major contributor to the GDP of the nation. Apart from this we have vast proportion of young population which is considered to be an asset of the nation. The population of youngsters should be well educated, trained then only we can have quality of people who can contribute to nation building activities. Therefore the development of higher education is a must. But during the covid-19 pandemic the entire education system has been disturbed. The present study is significant as it focuses on the importance of higher education and suggest remedies to face such pandemic situation.

**Objectives of the Study**

- To study the importance of higher education in Maharashtra
- To study the impact of covid-19 on the Indian higher education

**Scope of The Study**

The present study namely “ Impact of Covid-19 on the Higher Education in Maharashtra ” it covers only the importance of higher education in Maharashtra, its status during the pandemic and the remedial measures to restore the entire education system in the state.

**Research Methodology of the Study**

In order to undertake the present research and accomplish the objective, secondary source of data is used and collected with the help of few web sources and published sources like journals, books, etc.

**Significance of the Study**

The present study would help the state as well as central government to understand the importance of higher education in Maharashtra. It will help the ministry of higher education government of India and the said state government in framing the future education development policies.

**Impact of Covid -19 on Higher Education**

Indian Colleges will take time to adopt the approach of the education system here is a lecture-based approach to teaching. Digital teaching is more proof in schools and the school students/ teachers/parents are more comfortable with this approach when compared to higher education set-up in India. During COVID-19, online teaching has become a necessity, for not only colleges in India but worldwide to look for innovative solutions in no time. With board exams, university exams, college exams, the entrance test being postponed, it will be a big challenge for colleges to complete their syllabus on time without compromising on the education quality. From delay in board exams to college being shutdown to delay in national level entrance tests, it is the academic year of the students that is impacted. JEE Main of engineering education in India has already been postponed due to the Coronavirus outbreak & will lead to the long delay in the start of academic sessions for most of the engineering colleges and most of the other colleges will witness a delay as well. The students aspiring to take admission in 2020 have no idea about how and where they should apply to colleges from here on.

The COVID-19 scare to students who were to appear in entrance exams and / or to class 12 students appearing for Board exams. KCET, GUJCET & MHT CET (supposed to be conducted in April) are expected to be postponed to September tentatively. CBSE has also postponed its exam for now and will release the revised dates. It is not incorrect to assume that we will soon see many other organisations follow suit and a whole lot of entrance exams in India be further postponed due to Coronavirus. Looking at the state it is a matter of concern what the impact of COVID-19 (Coronavirus) will have on the higher education system in India. The rate at which Coronavirus has spread to different parts in India has forced the central and state governments to shut down educational institutions and schools as a preventive measure resulting in the disorderliness of studies.

The Maharashtra state Government has given its decision on higher education to promote the students which are in final year of all fields. Maharashtra government, has decided to cancel the final year and final semester examinations and all the exams conducted under various universities in the state in the atmosphere of rising cases of coronavirus despite the lockdown. However, those who want to take the exam should submit it in writing to the university and a decision in this regard will be taken on the basis of the influence of the covid-19 pandemic situation. Those who do not want to take the exam due to the cancellation of the exam will get the degree according to the appropriate formula and those who want to take the exam will be decided later considering the situation of covid-19 pandemic.

It may be tough for the 2020 batch to find jobs or acceptability in universities abroad without clearing exams or one; regulatory bodies may not certify them, a point that's been communicated to the government. Survey Conducted independently by IIT-Bombay faculty B N Jagtap and education researcher Anand Mapuskar, the survey has found 80 per cent female and 84 per cent male students have expressed difficulty in funding education. A recent survey on the impact of Covid-19 on higher education in Maharashtra has shown that 82 per cent students anticipate difficulty in funding their education in the new academic year 2020-21. Conducted independently by IIT-Bombay faculty B N Jagtap and education researcher Anand Mapuskar, the survey has found 80 per cent female and 84 per cent male students have expressed difficulty in funding education. The urban-rural divide is evident in the response to the survey, as 78 per cent students from metro cities, 80 per cent from district headquarters, 83 per cent at taluka headquarters and 88 per cent from rural areas said they anticipated these difficulties. The survey was conducted using Google forms, and with a sample size of 38,108 students (19,495 female, 18,602 male and four transgender) across all university regions of the state. The sample size is about 1 per cent of the number of students in the state. So far, the state higher and technical education department has not released any data on the impact of Covid-19 on students. Throwing light on the economic distress due to Covid-19, the report has found that 27 per cent students fear that chances of continuing with their studies in the academic year 2020-21 are "low to very low". This fear has been expressed by 29 per cent male and 25 per cent female students. The percentage is almost uniform over urban and rural settings. Whereas, 73 per cent students expect that they will have to financially support their families. According to the report, students have stated that a number of options will be needed to be thought of to resolve financial constraints, including part-time jobs (51 per cent), participation in earn-and-learn schemes (18 per cent), and helping family agriculture/business on a part-time basis (9 per cent). The primary source for internet facility for students is mobile internet with 79 per cent availing online education and 91 per cent using smartphones, while 32 percent have laptops or desktops and 6 per cent have no device.

## CONCLUSION

After taking an opinion by the students it has been understood that the lockdown has severe effect on education. Due to lockdown student can't able to focus on the studies and due to several problems faced by students and some are in favour of the that it has created the positive impact on students. They can access to the online educational courses to study and also the college professors are making them compatible for the new trend of online education. It's been a renaissance of online education in India. Cost of education is been the critical problem due to lockdown. As far as the sate of Maharashtra is concern even in metro cities like Mumbai and Pune may people working on daily basis, in private companies are finding very hard to survive. In case of online education the students need to have sufficient data pack to participate. The government should at least provide for the free data pack so that the poor person take the benefit of the online education. But through Maharashtra there are certain issues like lack of internet connectivity, inability to buy proper mobile set, therefore it is going to be difficult in the rural Maharashtra.

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**POST COVID-19 INDIAN ECONOMIC SCENARIO**

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**Dr. Mahesh B. Jadhav**Assistant Professor, Chikitsak Samuha's Sir Sitaram & Lady Shantabai Patkar College of Arts & Science and  
V.P. Varde College of Commerce & Economics, Mumbai, Maharashtra**ABSTRACT**

*Covid-19 (Corona Virus Disease-2019) is the infectious disease caused by the most recently discovered corona virus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December, 2019. The outbreak of Covid-19 has disrupted the Chinese economy and is spreading globally. We can't ignore the fact that the outbreak of COVID-19 has significant impact on the economy globally including economic slowdown, trade, supply chain disruption, commodities, and logistics. More than 200 countries across the world are lockdown for last few months, their socio-economic activities are badly affected. Everyone is trying very hard to survive in this situation. The people working in government sector are any how getting their salaries. In India major portion of the population is employed with the private sector are not getting their salaries, money at their disposal is getting reduced. The daily wage earners are going to their native places they are not even able to satisfy their basic amenities of life. This impact is highly uncertain which makes it difficult for policymakers to formulate an appropriate macroeconomic policies for a developing economies like India. It is our expectation at this time that the course of economic recovery in India will be smoother and faster than that of many other advance countries. Indeed the UNCTED in its latest report, the COVID-19 shock to developing countries has predicted that major economies least exposed to recession would be China and India.*

*The present paper seeks to study the impact of Covid-19 on Indian Economy and finally arrives a meaningful conclusion and provides scope for further research in this area.*

*Keywords: Indian Economy, COVID-19, Macro-economic Policies*

**INTRODUCTION**

As our new financial year commences, the Novel Coronavirus COVID-19 has infected more than 1.8 million people in more than 215 countries—a scourge confronting all of humanity, impacting lifestyles, businesses, economies and the assumption of common well-being that all of us have largely taken for granted.

Even before the onset of this pandemic, the global economy confronting turbulence on account of disruption in trade flows and attenuated growth. The situation has now aggravated by the demand, supply and liquidity shocks that COVID-19 has inflicted. Once the pandemic is controlled, the shape and speed of the recovery in the US and China will be key factors determining nature and traction of global economic recovery.

While we are focusing in India on Securing the population from health hazards and on providing relief, especially to the poor, we also need to think long term to secure the health of the economy, the viability of businesses and the livelihood of the people. Apart from providing robust safety nets for the vulnerable, ensuring job continuity and job creation is key. And there is an urgent need to mobilise resources to stimulate the economy. This is an attempt to address these issues. I foresee some of the ways in which the business landscape is likely to evolve in the days to come.

**REVIEW OF LITURATURE**

**CRISIL**(Credit Rating Information Services of India Limited) in its Research Report **The Covid-19 fallout, Quantifying first-cut impact of the pandemic (19<sup>th</sup> March, 2020)** stated that the Novel Coronavirus (Covid-19) has cast a long shadow over a much-anticipated mild recovery in the Indian economy in fiscal 2021, with the World Health Organization (WHO) declaring it a pandemic. External risks to global growth has increased significantly now. S&P Global foresees a recession in the US and the Eurozone, and has its forecast for China's growth slashed to 2.9% from 4.8% announced on March 5. Domestically, some hit to consumption demand because of social distancing is likely, though it is too early for that to reflect in data. Currently, the other downside to growth is also due to the financial sector stress now percolating to private sector banks. In view of this, CRISIL has cut its base-case gross domestic product (GDP) growth forecast for fiscal 2021 to 5.2%, from 5.7% announced recently. This factors in the huge uncertainty because of Covid-19, with risks to the forecast tilted downwards. The forecast will be reassessed continuously as new information becomes available. A serious downside to our base case can emerge from two developments. One, the pandemic is not contained by April-June 2020 globally, and makes the global slowdown more severe. And two, it spreads rapidly in India, affecting domestic consumption, investment, and production. These would further hurt confidence and the financial markets.

The **KPMG(Klynveld Peat Marwick Goerdeler)** a multinational professional services network and one of the big four accounting organizations in its research report **“The Potential Impact of Covid-19(April 2020)”** analysed that India’s real GDP decelerated to its lowest in over six years in 3Q 2019-20 and the outbreak of COVID 19 posed fresh challenges. Steps taken to contain its spread such as nationwide restrictions for 21 days and a complete lockdown of states have brought economic activity to a standstill and could impact both the consumption and investment. While Indian businesses, barring a few sectors, can possibly insulate themselves from the global supply chain disruption caused by the outbreak due to relatively reliance on intermediate imports, their exports to COVID-19 infected nations could take a hit. In sum, three major contributors to GDP such as private consumption, investment and external trade will get affected.

### **Problem of the Study**

Due to covid-19 the entire world economy has been affected, all the socio-economic activities have been slowed down across the globe. In case of Indian all the sectors in the economy are suffering badly due to this pandemic and as a result its affecting our economic growth. The resources at our disposal are scarce therefore the authorities should frame the policies so as to bounce back to the normalcy. The present study is significant due to this reason.

### **Objective of the Study**

- To study the present pandemic situation with respect to the various sectors of the Indian economy
- To suggest remedial measures to restore to normalcy.

### **Scope of the study**

There are different sectors in the Indian economy in the present research paper namely **IMPACT OF COVID-19 ON INDIAN ECONOMY** only few sectors of the economy have been emphasised.

### **Research Methodology of the Study:**

The study is descriptive and exploratory considering the objectives of the study the data collected are secondary source of data like books, National & international Journals, government reports, Newspapers, publications from various websites which focused on impact of COVID-19 on Indian Economy.

### **Significance of the study**

The present study will be significant for the central and the state government authorities in formulating the plans and policies to cope up with the present pandemic situation.

## **IMPACT OF COVID-19 ON DIFFERENT SECTORS OF ECONOMY**

### **Textile and Apparel:**

Demand shocks are expected to hurt India's textile exports over the next few quarters .With lockdown in China, price of Man-Made Fibre (MMF) imports is expected to rise significantly, resulting in higher price for some goods in the domestic market. If the current scenario persists over the next few months, the domestic retail market would also be impacted significantly. From a manufacturing perspective, employment would be impacted owing to limited demand in both domestic and international market .The textile and apparel sector production is expected to decline by 10-12 per cent in the Apr-Jun quarter .The cotton prices have been reduced by three per cent and are expected to be further impacted over the next few months.

### **Building & Construction**

The real estate sector is one of the largest employment generators in the country and has a multiplier effect on around 250 allied industries. The sector is expected to contribute to around 13 per cent to the country's GDP by 2025 and become the third-largest globally at USD 1 trillion by 2030. The housing sector is expected to see muted demand with significant reduction in the new launches .With possible slowdown in the U.S. and European economies, the existing demand for commercial real estate may either get curtailed or postponed till H2 of the current year. There is a high possibility of postponement of REIT launching (earlier scheduled for listing in 2020), which would mean further liquidity pressure on real estate developers. Fresh equity investments into the country’s real estate sector would slow down, with almost all sectors going through turmoil.

### **Chemicals and Petrochemicals**

India is sixth largest chemical and petrochemicals producer in the world, contributing to **3.5 per cent of global chemical Industry**. Slowdown in key downstream industries – textile and packaging (PET) due to lockdown have a ripple effect on petrochemicals demand, and also for liquid products driven by storage capacity constraints. Lower production operating rates are expected for rest of chemicals as well, apart from ones in essential categories (fertilisers, pharma etc.).Majority of chemical producing units are SMEs and do not have a

buffer to meet a sudden increase in working capital requirements. Extension of credit to customers and suppliers alongside falling revenues in the short to medium term is expected to adversely affect cash flows. Restrictions on road movement to impact domestic supply chain in short term. Also, with closing down of major ports in China, global disruption in supply chain is expected. High instance of labour migration expected in chemicals sector due to uncertainty, as most of the operating units are SMEs. Issue may not be witnessed by large plants integrated with refinery units. Imports are expected to fall as major import sources Middle East and China are highly impacted by COVID-19. Additionally uncertain short term demand outlook in India is expected to restrain traders/importers. For petrochemicals, prices are expected to be under pressure due to drop in weak demand and market uncertainty. For other chemicals, supply tightness, due to impact of COVID-19 in China might keep prices moderate to high in short-medium term even with muted demand

### **Consumer, Retail & Intrernet Business:**

We are in the midst of a global pandemic and with the guidance around social distancing to counter the COVID-19 threat, it is logical to expect **consumers to over-stock on essentials products and commodities**. The existing uncertainty around how the pandemic shapes up may result in a **uptick in spend by consumers in categories like rice, flour and lentils**. This may give a slight fillip to sales for FMCG companies, but at the same time this may be neutralised by a drop in levels in 'stock-in-trade' due to potential supply chain disruptions. The coming two to three weeks would be a testing ground on how supply chains are able to keep pace with this temporary rise in consumption. The **e-commerce sector will also face the challenges** due to COVID-19 and may see a dip in growth. There will be **increased pressure on supply chain for deliveries of products** and another challenge for Ecommerce companies is that they will need to equip their employees with the appropriate resources to manage operations remotely with little or no disruption. Going forward, we could expect companies to explore newer distribution channels focused on a 'direct to consumer' route. Further, the ability to predict and manage demand will be a gamechanger. In this environment, shoring up the customer relationship while focusing on the bottom line will be key.

### **Education & Skills**

Skill institutes in India are training more than 10 million trainees annually<sup>5</sup> – lockdown would decrease the available skilled manpower by 10-15 per cent. This coupled with sluggish human resource demand is likely to increase unemployment rate in the country. Once operations resume, there will be issues with sustainability of MSMEs leading to a large number of Schools around the country have been impacted by COVID-19, facing closures that could last several weeks that too during the crucial period of academic year ending. Public schools and low-fee private schools especially are likely face a larger impact on teaching and learning, owing to heavy reliance on brick and mortar means of delivering lessons. The challenge in a country like India is the additional economic burden facing the parents in the absence of school provided mid-day meals. Private schools that have the means and resources on the other hand, could try to minimise impact on teaching-learning, but could face cash flow issues if fee payments are delayed. In higher education, most Higher Education Institutions (HEI) are not fully geared to implement online learning, with constraints around availability of digital content, technology and delivery capabilities. The impact of the COVID-19 outbreak is also expected to impact admissions to HEIs in the coming academic year. Placements, internships for students could also be affected with companies delaying the onboarding of students. The outbreak is also expected to have far reaching consequences such as decreased global mobility of students (both inbound and outbound), difficulty in recruiting faculty, etc.

### **Food & Agriculture**

Indian is an agricultural economy. Since agriculture is the backbone of the country and part of government announced essential category, the impact is likely to be low on both primary agricultural production and usage of agro-inputs like seeds, pesticides and fertilisers. Major destinations like the U.S. Europe, China will grapple with COVID-19 for the next 6 months and Indian export based companies will be impacted due to low consumer demand and port hurdles. Partial diversion of export inventories to domestic market will help the players in the interim. Farm gate prices for export oriented commodities like seafood, mango, grapes are crashing and this will impact future crop availability. Due to fake propaganda, poultry sector (eggs and chicken) is heavily impacted. Fresh meat, seafood have erratic supply chain as there is no clarity from state governments on retail shops. Brick and mortar grocery retail chains and shops are operating normally but shortage of staff is impacting operations. It is expected that prolonged lockdown will result in increased demand for food supplies. Online food grocery platforms are heavily impacted due to unclear police restrictions and stoppage of vehicles. Last mile delivery platforms are impacted too.

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**CONCLUSION**

The impact of Covid-19 is not restricted to the loss of human lives but can threaten the economic stability of our country. Hence, the government should come up with the effective plans and policies to blunt at least some of the economic impact of the COVID-19, which continues to spread across the India. The series of short term, medium term and long term measures must be taken. All sectors of the country, Public and Private must put forth the efforts to contain the spread of coronavirus. The first measures should be of sanitary measures in order to attend to and deal with the disease with the support of governing body. Specific measures should be taken to meet the needs of those who are economically affected by this lockdown. An emergency relief package must be announced for the sectors which are badly affected by the lockdown. Recently, the Ministry of Health declared 325 districts as Green Zone which means these districts are unaffected from Covid-19. The government may give permission to start the business activities with precautionary measures against Covid-19 in such districts. The Indian Government & RBI need to support the Indian industry and economy at this juncture in different ways. In order to maintain liquidity at surplus levels the government should provide special liquidity support to companies, Non-Banking Financial Companies (NBFCs), Banks that come under strain due to intensifying risk aversion in financial markets or due to large demand shock. The Credit Limit should be increased for all regular banking accounts by 25 percent across the board .At the same time. overdraft facility limit should be increased to state governments from the RBI. Government should Pay the pending GST compensation to states immediately. IBC (Insolvency & Bankruptcy Code) to be suspended for a short period for the above mentioned sectors and aviation and hospitality sectors also as they are the worst affected.

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**AN EXPLORATORY STUDY ON QUALITY OF LIFE USING WHOQOL-BREF OF UNIVERSITY EMPLOYEES WITH TYPE 2 DIABETES MELLITUS VISITING THE MYSORE UNIVERSITY HEALTH CENTRE**

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**Introduction:** Type 2 diabetes mellitus (T2DM), a chronic non-communicable metabolic disease can have a negative impact on their overall quality of life (QOL). The purpose of our research was to evaluate T2DM patients' quality of life and its impact on gender, as well as to identify risk factors for poor QOL.

**Methods and Materials:** A cross-sectional exploratory study was conducted on 35 T2DM subjects (30–70 yrs., 16 M, 19 W) over a period of 2 months at the University Health Centre, Mysuru. Standard methods were used to assess socio-demographic profiles, anthropometric measurements, and Hb. The WHOQOL-BREF questionnaire was used to assess QOL in the English edition. The reliability was validated by Cronbach's alpha (= 0.83). To determine the QOL of T2DM patients, descriptive statistics, Pearson correlation, independent sample t, and linear regression tests were used.

**Result:** The majority of the subjects were women (54.3%). The QOL of women was lower when compared to men in all four domains and overall QOL. The lowest and the highest mean scores were observed in the psychological health domain (56%) and the environmental health domain (63%), respectively. Women were found to have a higher body mass index (BMI) > 25 kg/m<sup>2</sup>, a longer duration of diabetes (> 10 years), and an increased non-vegetarian type of diet (73.7%) as the risk factors. Backward multiple linear regression revealed that BMI and T2DM diagnosed age were significantly associated with the psychological health domain, while haemoglobin (Hb) was significantly associated with the domains of physical health and social relationships.

**Conclusion:** The findings of our study, suggest that high BMI, duration of diabetes, low Hb levels, and non-vegetarian type of diet, are risk factors for the development of diabetes-related complications and eventually results in a reduction in QOL, which has an impact on society and family productivity.

**Keywords:** WHOQOL-BREF, T2DM, BMI, and Hb.

**INTRODUCTION**

Quality of life is an important scale to measure health outcomes in subjects with T2DM, where it will be helpful in determining whether subjects are leading a healthy life or not. However, the quality of life varies from person to person, within gender, and within the subjects' own society and culture (Sreedevi, A., Cherkil, S., et al., 2016). Quality of life is defined by the World Health Organization (WHO) as "an individual's perception of their position in life in relation to their goals, expectations, standards, and concerns in the context of the culture and value systems in which they live." (Kumar, P., Agarwal, N., et al., 2016). The WHOQOL-BREF was developed by WHO to measure the mortality, morbidity, effect of disease and impairment on daily activities and behaviour, functional status, impact of medicine, health, and wellbeing of an individual, which helps in assessing the patients' needs in order to improve their QOL in a holistic approach to health, health care, and wellbeing (WHO, 1996).

Type 2 diabetes mellitus (T2DM) is primarily caused by an insufficient supply of the b-cell hormone insulin. This is characterised by insulin resistance and insufficiency, resulting in hyperglycaemia (high blood glucose levels): fasting blood sugar (FBS)  $\geq 126$  mg/dl (7 mmol/L), postprandial blood sugar (PPBS)  $\geq 200$  mg/dl (11.1 mmol/L) (Draznin, B., et al., 2022). Furthermore, complications of diabetes can sometimes be avoided if diagnosed and treated early (Chung, S., et al., 2014). Diabetes is one of the fastest growing global health emergencies of the 21<sup>st</sup> century. Diabetes affects more than 415 million people worldwide, with that number estimated to rise to 642 million by 2040 (Sun, P., et al., 2022). The International Diabetes Federation (IDF) has estimated that in India, the number of adults who are in the age group of 20 to 79 years with diabetes in 2021 and 2045 is 74.2 million and 124.9 million (Atlas, D, 2021).

The number of adults with diabetes per 100 overweight adults in India and compared this estimate to the global average due to the strong correlation between diabetes and being overweight (Draznin, B., et al., 2022; Tandon, N., et al., 2018). The number of adults who consume 2700 kcal per day or more (high-calorie diet/energy dense diet) is thought to be at a higher risk of T2DM (Seidell, J. C., 1999). Adult populations, on the other hand, are confronted with ongoing changes in the physical demands of work and leisure time. Many sorts of labour

have become more mechanised, and transportation has changed, resulting in an ever-increasing number of individuals being sedentary for most of the time, which may lead to weight gain. Obesity prevalence rises rapidly with slight changes in average body weight. Obesity prevalence rises by 5 percentage points for each and every unit increase in BMI (Seidell, J. C., 2000). According to the WHO, over 300 million people will be obese by 2025 (WHO, 1998). Adults with increased weight, severity of obesity, and duration of obesity are all independently and substantially associated with the increased risk of T2DM (Sigit, F. S., de Mutsert, R., et al., 2022). Diabetes risk spikes quickly at certain BMI levels, especially for populations of Asian origin (Seidell, J. C., 2000).

The sheer number of incidents of people having diabetes mellitus signals a tremendous burden on one's and their families' lives. They suffer substantial economic loss through direct medical costs, loss of work, and wages. Diabetes and its complications and the issues arising have quite an impact on QOL. They lead to diminished self-care, leading to the development of complications, and they often become overwhelmed by their ailment and the obligations of regular maintenance. Several studies have shown that people with T2DM face a variety of issues that can have a negative impact on their quality of life. (Sreedevi, A., Cherkil, S., et al., 2016 ; Pandey, S., Kumar, P., et al., 2020; Gholami, A., Azini, M., et al., 2013).

The WHOQOL-BREF questionnaire is one of the universal instruments used to measure the QOL of T2DM subjects. The objective of the present study was to assess the QOL of T2DM subjects by gender and to identify some of the risk factors associated with the QOL of T2DM subjects in the University Health Center, Mysuru.

### **Rationale of This Study:**

To comprehend the overall quality of life of T2DM subjects and to identify the major risk factors responsible for the decreased quality of life (QOL).

### **Materials and Method**

**Study design:** This present cross-sectional exploratory study was conducted over 2 months, on subjects diagnosed with T2DM (n = 35; men = 16 & women = 19) aged between 30 -60 yrs, recruited with the help of a physician from the University Health Centre of the University of Mysore, Mysuru, Karnataka. Informed consent was taken and the study abided by the ethical guidelines given by the Institutional Ethics Committee (IHEC-UOM No.174/PhD/2020-21). Data was collected using a standardised questionnaire that included a demographic profile, a modified Kuppuswamy score for socio-economic status (Saleem, S. M., & Jan, S. S., 2019), disease status, disease duration, family history of DM and CVD, anthropometric measurements that included height, weight, BMI, and biochemical parameters-Hb (Kumar, P., Agarwal, N., et al., 2016).

**Selection criteria:** The subjects were recruited based on the inclusion and exclusion criteria. Subjects with T2DM were included in the study. Subjects with known cardiovascular problems, pregnant women with gestational diabetes, and lactating mothers, one who required surgical interventions, anti-inflammatory, and anti-psychotic medication, were all excluded from the study.

The WHOQOL-BREF questionnaire was administered to measure the quality of life of the T2DM patients. The questions and options were read out to those who could not read them, and then explained to complete the questionnaire. The questionnaire was comprised of a total of 26 questions pertaining to four domains, viz., physical health, psychological health, social relationships, and environmental health. The respondent was asked to reply to these domains as perceived by them on a five-point Likert scale, where a score of five was for the most positive response. As per the WHO, 2004 user manual, raw scores for the domains of WHOQOL-BREF were calculated by adding values of single items and were transformed on a scale ranging from 0 to 100. QOL is measured on a scale of 0 to 100, with 100 being the highest and 0 being the lowest. Higher test scores are associated with higher QOL. All of them were informed that their responses would be treated confidentially (Gholami, A., Azini, M., et al., 2013; Odili, V., Ugboka, L., et al., 2008).

### **Statistical Analysis**

The data analysis was done using Statistical Package for Social Science (SPSS) software (Version 20) for descriptive statistical analysis of the socio-demographic profile and clinical and biochemical parameters. The reliability of the WHOQOL-BREF domains was assessed by using Cronbach's Alpha, which measures internal consistency between items on a scale (0.839 and over were deemed acceptable). We examined the level of association between four domains of the WHOQOL-BREF by using Pearson's correlation coefficient. For all analyses, the level of significance was fixed at  $p < 0.05$ . The mean difference in the quality of life scores between men and women with T2DM was calculated and statistically tested by an independent sample t-test. Multiple linear regression models (with the backward method) were used to investigate the relationships between T2DM subjects with 4 domains of QOL and risk factors with their characteristics. (Gholami, A., Azini, M., et al., 2013).

## Results

A total of 35 T2DM subjects (16 men and 19 women) participated in the study. The number and percentage of the socio-demographic profile of the subjects were described in table 1. The majority of the study population was literate (82.9%), with 68.6% employed. As per Kuppaswamy's socio-economic status, 42.1% of women belonged to the upper lower class, whereas the total percentage of the same is 34.3%.

The distribution of the risk factors for the subjects is described in table 2. The duration of diabetes in 31.4% of both men and women was <5 y, while in 47.4% of women it was >10 y. Women were associated with a higher percentage of obesity (94.7%) in the classification of BMI, a family history of DM (57.9%), and a non-vegetarian type of diet (73.7%) when compared with men.

The Pearson correlation between the four domains of WHOQOL-BREF revealed significant correlations between all domains ( $p < 0.01$ ) (Table 3). Increased physical health, psychological health, social relationships, environmental health, and overall QOL domain scores support the hypothesis that improved overall QOL in T2DM subjects.

An independent sample t-test conducted to compare the four domains of QOL between men and women showed a significant difference in all the domain scores (table 4).

The backward multiple linear regression model identified that the BMI and T2DM diagnosed age were significantly associated with the psychological health domain, whereas haemoglobin (Hb) was significantly associated with the domains of physical health and social relationships, as described in table 5.

In WHOQOL-BREF, four domains with overall QOL are plotted on a bar graph, shown in Figure 1, and it clearly says that the majority of the study population had good QOL in environmental health when compared with the other domains. The psychological health domain is more affected in the T2DM subjects, with a moderate and similar pattern of reduced QOL can be seen in the physical health, psychological health domain, and overall quality of life.

The four domains of QOL and overall QOL of T2DM subjects were compared between genders, which shows that a significant difference can be observed between men and women. Where women show a reduced QOL when compared with men, it can be seen in all the four domains and overall QOL.

## DISCUSSION

The present study was conducted to determine the QOL of T2DM and to identify the risk factors that are associated with QOL. The QOL of T2DM was compared between men and women. The majority of the study subjects were women (54.3%) in our study. Similarly, this can be observed in the Neyshabur region study (Gholami, A., Azini, M., et al., 2013). Paid jobs, non-alienated work, and economic means, which are all correlated with a high degree of self-control, help to reduce suffering. According to Indian studies, education (82.9%) enhances QOL (Sreedevi, A., Cherkil, S., et al., 2016; Pandey, S., Kumar, P., et al., 2020; Gholami, A., Azini, M., et al., 2013). The overall QOL mean score of the subjects is 59%, indicating a moderate QOL in them (Gholami, A., Azini, M., et al., 2013). The history of hypertension was higher in women when compared with men, which shows a reduced quality of life. A similar finding was observed in the study conducted in Bihar, India (Pandey, S., Kumar, P., et al., 2020).

The cumulative scores of all the four components of QOL, such as physical health, psychological health, social relationships, and environmental health, were found to be much lower than that of men subjects, similar to an earlier report (Gholami, A., Azini, M., et al., 2013). The remaining domains were also strongly connected, with social relationships and overall QOL playing a significant role. It could be due to the following factors: women with higher BMI ( $>25 \text{ kg/m}^2$ ), a higher history of hypertension; a similar observation was shown in the Patna, 2022 Indian study (Pandey, S., Kumar, P., et al., 2020); T2DM for more than 10 years; a higher family history of DM; higher frequency of non-vegetarian diet consumption; higher non-working (home-maker) occupational status; and a higher level of upper lower category in Kuppaswamy socio-economical grade than men.

The backward multiple linear regression model identified that Hb was significantly associated with physical health and social relationship domains. Increased consumption of energy-dense foods and more inactive lifestyles will lead to increased BMI, which shows a significant correlation in the psychological health domain. A similar finding was observed in the studies conducted in Bihar, India (Pandey, S., Kumar, P., et al., 2020) and Patna, India (Pandey, S., Kumar, P., et al., 2020). Psychological health was significantly correlated with T2DM diagnosis age.

Diabetic patients are regularly reminded of their condition; they must eat wisely, exercise, check their own blood sugar levels, and plan their upcoming meals or medications based on the results. Furthermore, they must



periodically start checking for hypoglycemia or hyperglycemia symptoms, as well as dealing with anxieties about diabetes complications (Odili, V., Ugboka, L., et al., 2008), the subjects' feelings that they don't have a good bodily image (increased BMI), uncontrolled blood sugar level, sedentary activity (being inactive), negative feelings (Gholami, A., Azini, M., et.al., 2013), early diagnosis of T2DM, disease burden, and low Hb level, affect the psychological health domain (56%) in individuals.

**Table 1:** Socio-demographic characteristics of T2DM subjects (n = 35)

Characteristics		Men	Women	Total
		Number (%)	Number (%)	Number (%)
Gender	Men	16(100)	0(0)	16(45.7)
	Women	0(0)	19(100)	19(54.3)
Education level	Literate	15(93.8)	14(73.7)	29(82.9)
	Illiterate	1(6.3)	5(26.3)	6(17.1)
Occupation	Working	16(100)	8(42.1)	24(68.6)
	Non-working	0(0)	11(57.9)	11(31.4)
Kuppuswamy Socio-Economical Status	upper	1(6.3)	1(5.3)	2(5.7)
	upper middle	6(37.5)	4(21.1)	10(28.6)
	lower middle	5(31.3)	3(15.8)	8(22.9)
	upper lower	4(25)	8(42.1)	12(34.3)
	Lower	0(0)	3(15.8)	3(8.6)
	Smoker	4(25)	0(0)	4(11.4)

**Note:** %- Percentage and T2DM- Type 2 Diabetes Mellitus.

**Table 2:** Risk factors in T2DM subjects (n = 35)

Characteristics		Men	Women	Total
		Number (%)	Number (%)	Number (%)
Age	31 – 59 yrs.	12(75)	13(68.4)	25(71.4)
	≥60 yrs.	4(25)	6(31.6)	10(28.6)
Duration of Diabetes	Recently Diagnosed (>1 Month)	2(12.5)	4(21.1)	6(17.1)
	< 5 yrs.	6(37.5)	5(26.3)	11(31.4)
	5 - 10 yrs.	2(12.5)	1(5.3)	3(8.6)
	>10 yrs.	6(37.5)	9(47.4)	15(42.9)
BMI Classification	Normal or lean / 18.5 to 22.9 kg/dl	1(6.3)	0(0)	1(2.9)
	Overweight / 23.0 to 24.9 kg/m <sup>2</sup>	5(31.3)	1(5.3)	6(17.1)
	Obese / >25 kg/m <sup>2</sup>	10(62.5)	18(94.7)	28(80)
Family History of DM	Yes	9(56.3)	11(57.9)	20(57.1)
	No	7(43.8)	8(42.1)	15(42.9)
Family History of CVD	Yes	2(12.5)	3(15.8)	5(14.3)
	No	14(87.5)	16(84.2)	30(85.7)
History of Hypertension	Non hypertensive	9(56.3)	8(42.1)	17(48.6)
	Hypertensive	7(43.8)	11(57.9)	18(51.4)
Type of Diet	Vegetarian	4(25)	5(26.3)	9(25.7)
	Non-Vegetarian	12(75)	14(73.7)	26(74.3)
Hours of sleep per day	6-7 hours	3(18.8)	6(31.6)	9(25.7)
	>7 hours	13(81.3)	13(68.4)	26(74.3)
Hb (g/dl)		16(50)	19(50)	35(100)

**Note:** %- Percentage, T2DM- Type 2 Diabetes Mellitus, DM- Diabetes Mellitus, CVD- Cardiovascular Disease, BMI- Body Mass Index, g/dl- gram per deciliter

**Table 3:** Pearson Correlation Analysis among four domains of QOL in T2DM subjects (n = 35)

	Physical Health	Psychological Health	Social Relationships	Environmental health	Total domain score
<b>Physical Health</b>	1				
<b>Psychological Health</b>	.622**	1			
<b>Social Relationships</b>	.784**	.763**	1		
<b>Environmental health</b>	.842**	.771**	.866**	1	
<b>Total domain score</b>	.868**	.866**	.950**	.956**	1

Note: \*\*. Correlation is significant at the 0.01 level (2-tailed).

**Table 4:** Whoqol-Bref scoring pattern of both men and women in T2DM subjects (n = 35)

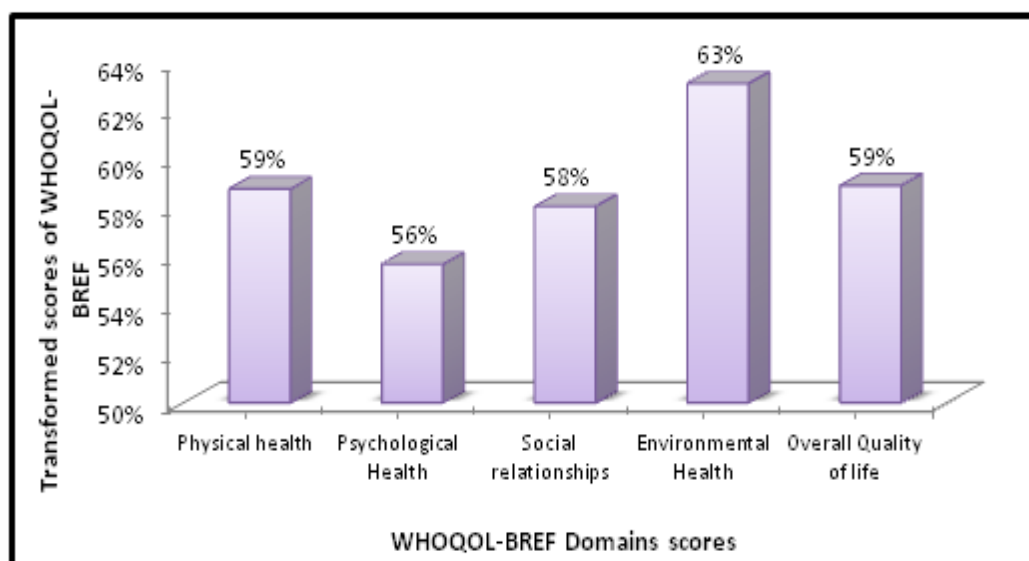
Variables	Gender	Mean	SD	t	p-value
Physical Health	Men	63.19	8.352	2.128	.041*
	Women	55.11	13.102		
Psychological Health	Men	62.63	12.241	2.392	.023*
	Women	49.95	17.958		
Social Relationships	Men	68.75	19.365	2.593	.014*
	Women	49.11	24.522		
Environmental Health	Men	70.88	16.194	2.043	.049*
	Women	56.63	23.571		
Over all QOL	Men	66.359	13.144	2.548	.016*
	Women	52.697	17.710		

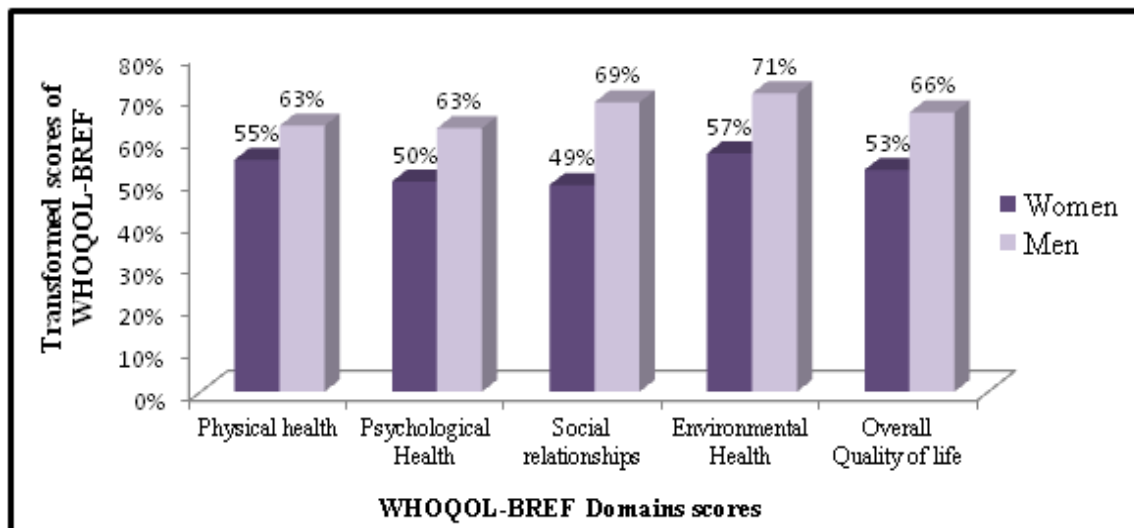
Note: QOL- Quality of Life, \* - Significant.

**Table 5:** Backward multiple linear regression analysis of significant factors associated with WHOQOL-BREF in T2DM subjects (n = 35)

QOL	Factors	Beta coefficient	t	p-value
Physical Health	Hb (mg/dl)	2.908	3.216	0.003*
Psychological Health	T2DM diagnosed age	0.690	2.618	0.014*
	BMI	2.059	3.660	0.001*
Social Relationships	Hb (mg/dl)	4.919	2.987	0.005*
Environmental health	Hb (mg/dl)	3.278	1.942	0.061
Overall QOL	T2DM diagnosed age	0.496	1.191	0.065
	BMI	1.083	1.854	0.074
	Hb (mg/dl)	2.534	1.906	0.066

Note: g/dl- Gram per decilitre, mg/dl- Milligram per decilitre, Hb- Haemoglobin, BMI- Body Mass Index, QOL-quality of life, BMI- body mass index, \* - Significant.

**Figure 1:** Comparison of transformed scores of WHOQOL-BREF across 4 domains with overall quality of life in T2DM subjects (n = 35)



**Figure 2:** Comparison of transformed scores of WHOQOL-BREF across 4 domains with overall quality of life between Men and Women in T2DM subjects (n = 35).

## CONCLUSION

The results suggest that the QOL of T2DM in women was lower when compared with men in all the domains. This is mainly because of the increased consumption of energy-dense foods and sedentary lifestyles, which lead to increased BMI (obesity). It is important to focus on improving QOL in women. There is a need for a multifaceted strategy such as lifestyle modification, healthy diet with reduced portion size and increased frequency of meals, and nutrition education to achieve glycaemic control and weight management. Such strategies will aid in the management and prevention of risk factors in T2DM patients.

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## CONFLICTS OF INTEREST:

The authors declare that there are no conflicts of interest.

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## OKRA AND IT'S PHARMACOLOGICAL PROFILE: ANOVERVIEW

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## ABSTRACT

Okra commercial vegetable crop belong to family Malvaceae. It originates from Ethiopia and is widely spread all over tropical, subtropical and warm temperate regions of the world. It play an important role in the human diet and is a good source of protein, carbohydrates, vitamins, calcium, potassium, enzymes. The various part of these plant used for medicinal purpose. It has various reported pharmacological properties like antidiabetic, antioxidant, nootropic, eye, heart disease and neurological disorders etc. This effort is towards providing the evidence in support to encourage more scientific research to find out more pharmacological and nutritional potential of *Abelmoschus esculentus* that may be suggestive of new drug discovery.

**Keywords:** okra, *Abelmoschus esculentus* (L.), diet.

## INTRODUCTION: - Okra

(*Abelmoschus esculentus*) is the vegetable crop of significance in the Malvaceae family and it is important vegetable in Bangladesh and grows well throughout our country in seasonally. It's origin in South Asia, Ethiopia and West Africa (National Research Council, 2006)<sup>3</sup>. It is a tropical to subtropical crop and is sensitive to frost; low temperature, water logging and drought conditions, and cultivation from different countries have certain adapted distinguishing characteristics specific to the country to which they belong<sup>3</sup>. It is an oligo purpose crop, but it is usually consumed for its green tender fruits as a vegetable in a variety of ways. These fruits are rich in vitamins, calcium, potassium and other mineral matters. The mature okra seed is a good source of oil and proteins have been known to have superior nutritional quality. Okra seed oil is rich in unsaturated fatty acids such as linoleic acid, which is essential for human nutrition its mature fruits and stems contains crude fiber, which is used in the paper industry<sup>4</sup>.

Okra is a multipurpose crop due to its various uses of the fresh leaves, buds, flowers, pods, stems and seeds.<sup>5</sup>



**Fig:** Plant of *Abelmoschus esculentus* (OKRA)

## Description

**Biological Name:** - *Hibiscus esculentus*, *Abelmoschus esculentus*.

**Scientific Classification:** Kingdom:- plantae Division:- Magnoliophyta Class :- Magnoliopsida (Unranked):- Rosales Order :- Malvales

**Genus:** - *Abelmoschus*

**Species:** - *esculentus*

**Binomial Name:** - *Abelmoschus esculentus* **Other Names:** - Kacang, Bendi, Qui

Kui, Okra, Okura, Okro, Quiabos, Ochro, Quiabo, Gumbo, Quingombo, Bamieh, Bamya, Quingumbo, Bamia, Ladies Fingers, Bhindi, Kopi Arab<sup>24</sup>.

### Biochemical Composition of Okra

The composition of okra pods per 100g edible portion is water 88.6 gm, energy 144.00 KJ (36Kcal), protein 2.10 g, carbohydrate 8.20 g, fat 0.20 g, fiber 1.70 g, Ca 84.00 mg, P 90.00 MG, Fe 1.20 mg,  $\beta$ carotene 185  $\mu$ g, riboflavin 0.08 mg, thiamin 0.04 mg, niacin 0.60 mg, ascorbic acid 47.00 mg, protein, carbohydrate and vitamin. Contains of okra and plays a vital role in human diet. Consumption of young immature okra pods is important as fresh fruits, and it can be consumed in different forms. Okra fruits is principally consumed fresh or cooked and is a major source of vitamin A, B, C, minerals, Iron and Iodine and important vegetable source of viscous fiber but it is reportedly low in sodium saturated fat and cholesterol. Presence of Fe, Zn, Mn and Ni also has been reported. Okra provides an important source of vitamins, calcium, potassium and other mineral matters which are often lacking in the diet in developing countries. Seven days old fresh okra pods have the highest concentration of nutrients. The composition of okra leaves per 100 g edible portion is water 81.50 g, energy 235.0 kJ (56.0 kcal), protein 4.40 g, fat 0.60 g, carbohydrate 11.30 g, fiber 2.10 g, Ca 532.0 mg, P 70.0 mg, Fe 0.70 mg, ascorbic acid 59.0 mg,  $\beta$ carotene 385.0  $\mu$ g, thiamin 0.25 mg, riboflavin 2.80 mg, niacin 0.25 mg. Carbohydrate are mainly present in the form of mucilage, The leaf buds and Flowers are also edible. Okra seeds contains about 20% proteins and 20% oil. Okra seed oil has potential hypcholesterolemic effect. The potential for wide cultivation of okra for edible oil as well as for cake is very high.

Okra seed flour could also be used to fortify cereal flour. For example, supplementing maize ogi with okra meal increases protein, ash oil and fiber content. Okra seed flour has been used to supplement corn flour for a very long time in countries like Egypt to make better quality dough. Its ripe seeds are roasted, ground and used as a substitute for coffee in some countries. Mature fruits and stems containing crude fiber are used in the paper industry. Greenish-yellow edible okra oil is pressed from okra seeds; it has a pleasant taste and odor, and is high in unsaturated fats such as oleic acid and linoleic acid. The oil content of some varieties of the seed can be quite high, about 40%. Oil yields from okra crops are also high. A 2009 study found okra oil suitable for use as a biofuel. The roots and stems of okra are used for clarification of sugarcane juice from which gur or brown sugar is prepared<sup>10</sup>.

### Medicinal Uses of Okra:-

Demulcent, Diaphoretic, Diuretic, Emollient, Stimulant, Vulnerary.

**Root:** - The root are very rich in mucilage, having a strongly demulcent action. The mucilage can be used as plasma replacement. An infusion of the roots used in the treatment of syphilis. The juice of the roots used externally in Nepal to treat cuts, wounds and boils.

**Leaves:** - The leaves furnish an emollient, poultice, antispasmodic, anti-inflammatory, antioxidant,

**Fruit:** - For treating dysentery and diarrhea in acute inflammation and irritation of the stomach, bowels, and kidneys, catarrhal infections, dysuria diuretic.

**Seed:** - The seeds are antispasmodic, in managing blood glucose concentration, cordial and stimulant diabetes mellitus therapy.

**Flower:** - Used for treatment of bronchitis and pneumonia, Anticancer etc<sup>(6,7,8,9)</sup>

### Reported Pharmacological Properties<sup>11</sup> Gastro Protective Effect

Ablemoschus esculentus lectin (AEL) gastroprotective effect on gastropathy induced by ethanol 0.2 ml/animal, p.o. given to fasted mice of ethanol 99.9% received previously AEL (0.01, 0.1, 1.0, 10 or 50 mg/kg, i.v.), saline (5 ml/kg, i.v.) or ranitidine (80 mg/kg, p.o.). The mice were euthanized 30 min after ethanol challenge to verify the stomach damages. Gastric oxidative stress, tissue hemoglobin content and microscopic features were taken in order to characterize the AEL gastro protective effect. AEL (1mg/kg) was capable of protect mucosa against ethanol damages in presence of two Evaluation of microscopic features, oxidative stress, and Hb levels pointed the protective effects of AEL. AEL simultaneously showed antioxidant effect that is probably implicated in its intricate defensive mechanism of action<sup>12</sup>.

### Anti-Fatigue and Antioxidant Effects

The contents of total polyphenol and total polysaccharide were 29.5% and 14.8 % in okra seed and 1.25 % and 43.1% in okra skin, respectively. Total flavonoids, isoquercetin and quercetin-3-Ogentiobiose (5.35%, 2.067% and 2.741%, respectively) were only detected in okra seeds.

Antioxidant assays, including 1-diphenyl- 2-picrylhydrazyl scavenging, ferric reducing antioxidant power and reducing power test, and weight-loaded swimming test showed okra seeds possessed significant antioxidant and anti-fatigue effects. Moreover, biochemical determination revealed that anti-fatigue activity of okra seeds is caused by reducing the level of blood lactic acid and urea nitrogen, enhancing hepatic glycogen storage and

promoting antioxidant ability by lowering malondialdehyde level and increasing superoxide dismutase and glutathione peroxidase levels<sup>13</sup>.

#### **Antiadhesive Effects against H. Pylori**

Polysaccharide containing extracts from immature fruits of okra (*Abelmoschus esculentus*) are known to exhibit antiadhesive effects against bacterial adhesion of *Helicobacter pylori* (*H. pylori*) to stomach tissue. The present study investigates structural and functional features of polymers responsible for this inhibition of bacterial attachment to host cells. Ammonium sulfate precipitation of an aqueous extract yielded two fractions at 60% and 90% saturation with significant antiadhesive effects against *H. pylori*, strain-J99, after preincubation of the bacteria at 1 mg/ml<sup>14</sup>.

#### **Neurological Disorders (Alzheimer)**

The okra treatment provides important in vitro data on the effects of okra on various AID-associated cellular processes in H63D variant HFE cells. These results suggest okra may be beneficial in people expressing the H63D variant to reduce the risk of Alzheimer's disease and other neurodegenerative diseases related to oxidative stress<sup>15</sup>.

#### **Nootropic Potential**

The seed extracts of *Abelmoschus esculentus* L. Possess antioxidant, antistress, and nootropic activities which promisingly support the medicinal values of ladies finger as a vegetable. So the pretreatment of mice with aqueous and methanolic seed extracts of *Abelmoschus esculentus* (200 mg/kg, p.o) for seven days significantly ( $P < 0.01$ ) attenuated scopolamine-induced cognitive impairment in the passive avoidance test.

The extracts were significantly reduced the blood glucose, corticosterone, cholesterol, and triglyceride levels elevated by acute restraint stress<sup>16</sup>.

#### **Hypolipidemic and Anti Diabetic Effects**

The ethanolic extract of okra which contains isoquercitrin and quercetin 3-O- gentiobioside reduced blood glucose and serum insulin levels and improved glucose tolerance in obese mice. The isoquercitrin treatment shows serum triglyceride levels and liver morphology in the mice were significantly ameliorated. Total cholesterol levels in isoquercitrin and quercetin 3-O- gentiobioside treated mice were also reduced. So okra may serve as a dietary therapy for hyperglycemia and hypertriglyceridemia<sup>17</sup>.

#### **Immunomodulating Activity**

A water-soluble polysaccharide (OFPS11) was obtained from okra (*Abelmoschus esculentus*) flowers using aqueous extraction and purification with DEAE-52 cellulose and Sephacryl™ S-500 column. Its preliminary characterization and immunomodulating activity were investigated. Results showed that OFPS11 is mainly composed of galactose and rhamnose in a molar ratio of 2:23:1 with molecular mass of 1,700 kDa. RAW264.7 cells Additionally, OFPS11 enhanced the phagocytic ability and induced the elevation of NO production, TNF- $\alpha$  and IL-1 secretion of RAW264.7 cells. OFPS11 can strongly increase NF- $\kappa$ B levels in nuclei, which is an important transcription factor that can modulate expressions of Inos, NO and TNF- $\alpha$ . These outcomes support that OFPS11 exerts its antitumor activity by probably stimulating macrophage activities through nuclear NF- $\kappa$ B pathway<sup>18</sup>.

#### **Hepatoprotective Activity**

The antioxidant effect was assessed using DPPH and hydroxyl radical scavenging assays. The hepatoprotective effect of the extract was evaluated using CCl<sub>4</sub> intoxicated HepG<sub>2</sub> cell line and Wistar rats by estimating the levels of hepatic and antioxidant markers. The root extract of *A. esculentus* showed IC<sub>50</sub> values of 270.99 and

532.86 /mL for DPPH and hydroxyl radical scavenging assays, respectively. The incubation of HepG<sub>2</sub> cells with CCl<sub>4</sub> drastically decreased the cell viability and increased the leakage of transaminases. Pre-treatment with the extract significantly restored the cell death by 31.25 and 39.04% at 200 and 400 /mL concentrations, respectively. The reduction of ALT leakage by the treatment was 18.62, 38.59 and 52.15% compared to the CCl<sub>4</sub> treated cells at 100, 200 and 400 /mL, respectively. In in-vitro experiment also the treatment reduced the level of transaminases, ALP, MDA, total bilirubin and hepatic TNF levels as well as increased the antioxidant levels in a dose dependent manner.

Histological observations of liver sections showed reduction in steatosis, necrosis and inflammation<sup>19</sup>.

#### **Cardiovascular Disease**

Okra is also used to improve cardiovascular disease. The okra reduces serum cholesterol and therefore decreases the chance of heart disease. The use of okra is an efficient method to manage the body's cholesterol level. Okra

is additionally loaded with pectin that can help in reducing high blood cholesterol simply by modifying the creation of bile within the intestines<sup>20</sup>.

### Vital Substance for Optimum Pregnancy

Okra is full of both foliate and vitamin C. Which is responsible for maintaining and creating fresh cell, foliate is a vital substance for optimum pregnancy. It is preventing birth defects in the developing body.

Vitamin C also as well required for body development. Foliate is a vital nutrient that increases the growth and development of the fetus' brain. The high quantity of folic acid within okra performs a huge role within the neural tube formation of the fetus through the fourth to the 12<sup>th</sup> week of pregnancy<sup>21</sup>.

### Eye-Sight Improvement and Skin Nourishment

For eyesight improvement okra pods are used. The okra pods are implausible options for vitamin A and also beta carotene that are both important nourishment for sustaining an excellent eye-sight along with healthy skin<sup>22</sup>.

### CONCLUSION

In these review article, complied all medicinal and nutritional importance of okra plant. Okra plant is rich source of vitamins, minerals and phytoconstituents which are used in treatment of various ailments. It is essential that scientific community continues to unravel the mechanisms involved in disease prevention and determine how food bio-actives from such foods as okra can influence human health. So we can say okra is a miracle plant.

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**MODERN STRATEGIES TO PROMOTE DIVERSITY, EQUITY AND INCLUSION IN THE HYBRID WORKING OF I.T. STARTUPS**

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*A startup is a company or enterprise that an entrepreneur launches intending to discover, develop, and prove a scalable business model. While the word "startup" applies to all new firms, including self-employment and enterprises that never aim to register, startups refer to new businesses that aspire to develop beyond the sole founder. Startups are new businesses that have the intention of growing beyond the single founder. The hybrid system is a project that was initiated to satisfy the specific needs of the active parties in a system or organization. If a hybrid arrangement is available in a situation that meets certain requirements, it should offer a solution to the issues of location, distance, cost, availability, and administration. A startup from a conventional small or medium-sized business stands out with a distinctive and original product that has the potential for rapid worldwide expansion, with tens of millions of euros in annual sales as a need. Additionally, it should be noted that scalability is necessary from the beginning, enabling substantial exponential revenue growth without substantially increasing costs. The study aims to examine the modern strategies to promote diversity, equity, and inclusion in the hybrid working of IT startups. The study is suggesting that the startup strategy begins with diversified prospect, intricacy of the startup, loyalty and brand equity, the purpose and significance of brand, innovation, relationship, work-life commitment integrated into the corporate environment. This concept is then implemented by attitudes and actions.*

*Keywords: Startups; Modern strategies; Hybrid; Diversity; Equity*

**1. INTRODUCTION**

A start-up is a very small, incomplete, and imperfect business that is still developing quickly in its country of origin. Finding a company model run by an innovative and resilient team with a leader who has guided it in the correct direction is a must for its sustainability. Another requirement for a start-up's viability is a strategy, the purpose of which is to locate and utilize the business model in an environment of competition. Startups either overtly or implicitly strategize because they want to accomplish their objectives through actual action. Its success is impacted by other startups/companies in the sector, and the strategy aims to attain maximum performance given internal and external restrictions. It is assumed that start-up strategies, due to their small size and youth, have qualities that distinguish them from the typical strategies of larger and older organizations, and that their expertise might boost the chance for survival and subsequent entrepreneurial success.

A diverse workforce has become a significant consideration when selecting the best work environment. Companies are using diverse recruiting methods in response to the pressing demand for an inclusive/diverse workforce. Adverse effects the elimination of prejudices based on gender, age, race, and other attributes. According to several research, an inclusive workplace is more likely to recruit the top people, improve IT startup creativity, and generate more income. The first step in creating a diverse workforce is figuring out what reasons are preventing diversity hiring, as well as how to plan and act efficiently to get through these obstacles. One such tactic is to write job descriptions that are more gender-neutral and focused on results rather than prior experience. Diversity education can also assist in removing prejudices.

There must be accountability for group efforts to promote diversity and inclusiveness. Setting specific goals and doing diversity training can help with this. Hiring a Diversity, Equity, and Inclusive (DEI) officer is a crucial next step. By allocating funds for a DEI officer, the office may demonstrate to prospective workers and employers how it is working to be more inclusive and diverse. Recruitment tactics that emphasize diversity promote corporate expansion and aid in luring in fresh talent. It contributes to the innovation of IT startups. Employers are faced with a basic risk/reward decision as they seek to adapt to current working arrangements. Higher levels of flexibility, a better work-life balance, and a more specialized employee experience might all be provided via hybrid employment. These might significantly improve performance and efforts to promote diversity, equality, and inclusion (DEI). Hybrid work also has the potential to create an unequal playing field and intensify in-group vs out-group dynamics, which can transfer such advantages to the liabilities side of the ledger. Adopting ill-conceived hybrid work models may instead precipitate departures, limit inclusion, and decrease performance in businesses that are already trying to diversify and retain workers.

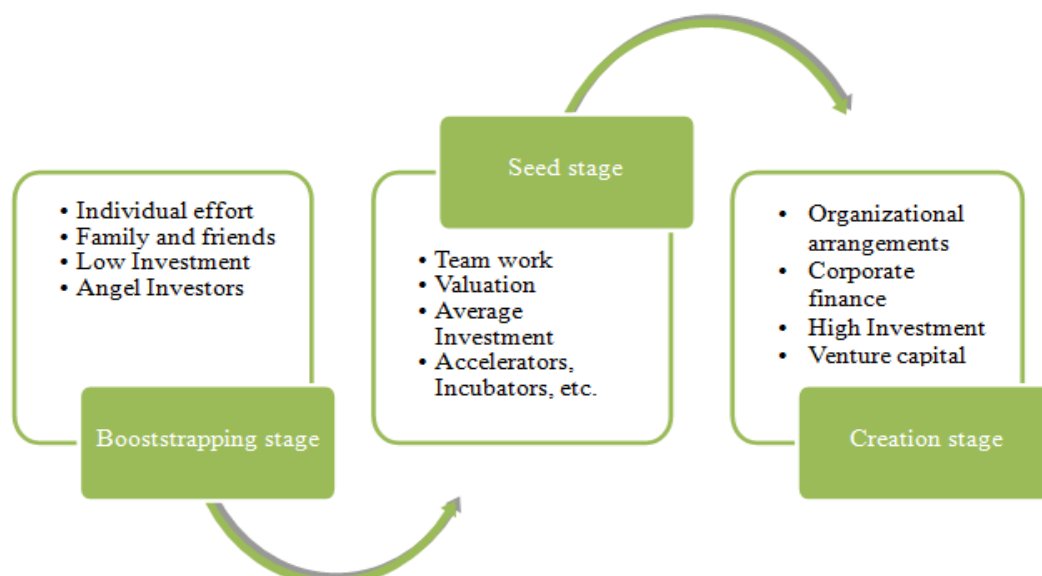
A hybrid system is also known as a blended system. It frequently occurs when two distinct sorts of requests must be adequately balanced to avoid any collisions or conflicts. The hybrid system is a project that was

initiated to satisfy the specific needs of the active parties in a system or organization. If a hybrid arrangement is available in a situation that meets certain requirements, it should offer a solution to the issues of location, distance, cost, availability, and administration. It is plausible to assert that the evolution of hybridity is the outcome of technological advancement. The hybrid working system ensures that the IT startup firm that uses it benefits from the remote working system (Trede, F., et al., 2019). Workplace flexibility, cheaper labor costs, increased worker satisfaction, and enhanced environmental experiences are all benefits of remote work. Also included is the advantage of the traditional working system. There is a guarantee of direct connection with the current workplace culture. Similar benefits include the value of informal networking, the likelihood of in-person cooperation, and the addition of a structure to support creativity. Hybridity refers to the circumstance where the advantages of both the traditional and remote workplace systems coexist (Malhotra, N., & Reay, T., 2019).

### 1.1 Modern Strategies of IT Startups

IT startups are a competitive business. Many entrepreneurs still prefer old marketing strategies over modern marketing techniques for digital startups. whereas entrepreneurship refers to all new enterprises, including self-employment and businesses that do not intend to register. Startups face a lot of uncertainty and failure at the beginning, but only a tiny fraction of them go on to become successful and noteworthy. A start-up may be defined as a modern cultural and entrepreneurial phenomenon that is less formal than a typical IT startup business has more informal norms and is anchored by outstanding individual self-realization. Blank, S., & Dorf, B., (2012) examined the startups as transient businesses that search for a scalable, repeatable, and lucrative business strategy. The authors of the business model canvas (Osterwalder, A., et al., 2014), which helps to visualize the business model, said that a start-up always strives to justify its existence, works under extremely difficult circumstances, and is expected to produce results. The predicted outcomes include market acceptability of the product and an alluring return on investment. According to Ries, E. (2011), a lean start-up is a human institution created to change the corporate world. to develop a brand-new good or service while facing a lot of uncertainty. Erik Ries' main contribution to the definition of a start-up is the inclusion of an unexpected backdrop that sets start-ups apart from regular businesses. From this, it may be concluded obliquely that startups are the ones that create the future and new demands. More business possibilities are created by it than are discovered.

Start-ups employ people who give up their regular jobs in favor of exciting personal growth and the achievement of specific results while operating in an environment of ambiguity and uncertainty. They may or may not rely on technology, and they stop being start-ups once they cross certain thresholds. They also expand quickly and temporarily without borders (acquisitions sales, profit, number of employees, and others). A typical small and medium firm startup is characterized by a unique and original product with the potential for rapid and worldwide expansion, with a revenue need of many tens of millions of dollars. It should also be noted that scalability is necessary from the beginning, implying the potential to generate significant exponential revenue growth without incurring additional expenditures.



**Figure 1:** Life cycle of startups

**Source:** [https://www.researchgate.net/figure/Lifecycle-of-startups-source-self-elaborated-I-Bootstrapping-stage\\_fig1\\_280007861](https://www.researchgate.net/figure/Lifecycle-of-startups-source-self-elaborated-I-Bootstrapping-stage_fig1_280007861)

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### 1.2 Diversity, Equity, and Inclusion of IT Startup

Diversity, equity, and inclusion (DEI) are essential for developing and maintaining a successful workplace based on the idea that all persons may achieve personally and professionally. Before beginning to evaluate efforts and implement new approaches, it is necessary to completely comprehend each component, both individually and about how they interact. DEI is an ethos that values different viewpoints and prioritizes inclusion and employee well-being as critical success factors. Startup companies must put programs and strategies in place that intentionally create workplaces that are more diverse, equal, and inclusive to bring those principles to life. Diversity is the presence of distinctions within a certain context. This might manifest in the workplace as disparities in "racial origin, ethnicity, gender identity, sexual orientation, age, and socioeconomic status". It can also refer to variations in physical prowess and veteran status, both of which are aspects of variety.

The foundation of the concept of "startup equity" is the notion that an organization's stakeholders should have a share in the startup since that is what that label implies. Usually, this entails giving investors and workers who made early contributions a fixed portion of the business. The date, level of contribution, level of commitment, and the value of the IT startup at the time of equity distribution all have an impact on what proportion is awarded. Consequently, founders often acquire the largest initial equity. Early investors in an IT startup company often earn more stock than later investors since their investments are proportionately higher relative to the company's early worth. Employees who assist get things started frequently have a higher amount of ownership than those who join the IT startup firm later on. The allocation of equity is very directly related to the stages of finance. As fundraising rounds proceed, financial conditions change, and in almost every case and allocate equity shifts as well.

The policies that promote diversity, equality, and inclusion (DEI) within the startup business form the foundation of an IT startup's culture. The business case and facts are unmistakable: Diverse and inclusive businesses consistently outperform, and inclusive leaders are beneficial to business. Putting DEI policies at the core of an organization's operations can go a long way toward assisting underrepresented groups (such as women, members of underrepresented communities of races and ethnicities, and people with disabilities) in overcoming biases that are present during the hiring process as well as obstacles that are placed in their path once they are employed. Furthermore, implementing DEI policies and procedures early on can assist leaders to avoid the frequently embarrassing and time-consuming task of retrofitting IT startups, which can also disclose prior behaviors that harmed minoritized groups (Kaul, K., 2021).

### 1.3 Hybrid Workplace

The term "Hybrid" is not brand-new. It has been used in a variety of representations over the years. In more recent times, the term "hybrid" has come to signify a whole new aspect of how technology has influenced how people live their lives. Systems are crucial because they enable the governance of individuals, groups, institutions, communities, and countries. When a system of operations is in place, only then can all mention flourish. In the true sense, chaos generates no results. The chaos merely adds to the existing confusion. The disarray simply serves to further complicate matters. Therefore, rigidity should not be mistaken for order or system in this situation. Order and flexibility can coexist, and the study appropriately investigated additional instances of this. Consider order as a system of procedures that enables the various social components to operate as they should. In the same way that educational institutions are responsible for imparting ideas and concepts to help youngsters change and become responsible adults, the government is in charge of developing policies for managing the state. The smaller organizations beneath them have unique systems they run, just as every industry has its system. These smaller organizations essentially act as the places of employment for the people that make them up. Without individuals, a structure or system does not exist, in actuality. A system that is built for individuals cannot be operated by an organization since it is useless without them. Different workplaces use various types of systems. A system like this can revolve around where to work, what days of the week to work, how many working hours to put in, who to report to, and who to supervise. The distinctive dynamics of a given process determine which system is dominant in that region (Radonić, M., et al., 2021).

## 2. LITERATURE REVIEW

Based on the above-mentioned introduction about "modern strategies to promote diversity, equity, and inclusion in the hybrid working of its startups". Diversity, Equity, and Inclusion (DEI) are critical to establishing and maintaining a successful workplace based on the concept that all individuals may succeed both personally and professionally. The following sections are the part of the review of literature:

- i. Modern Strategies to promote Diversity of IT Startups

- ii. Modern Strategies to promote Equity of IT Startups
- iii. The Hybrid Working of IT Startups

#### i. Modern Strategies to Promote Diversity of IT Startups

The selection of the firm's market environment is one of the most important decisions made by business founders. To analyze the pre-entry generation of founders' market choice sets, researchers looked for market possibilities in which the firm's technological resources, as represented in an item or service, may be commercialized. More diversified external information sourcing links and industry experience help to uncover not just more (remote) market possibilities, but also more varied (external) market prospects. The extent to which the strategic variety of such chances was discovered, on the other hand, was governed by the technological competence of the founders, but technological expertise was less significant in influencing the number of opportunities (Gruber, M. et al., 2013). A recent appeal advocated broadening the definition of university entrepreneurship to recognize the diversity of situations and individuals participating in the entrepreneurial development process. There is still a knowledge gap about the range of initiatives created by various academic stakeholders and the connections between these entrepreneurial activities and university purposes, including teaching and research. The study addressed this specific need by examining how university teaching and research activities impact university entrepreneurial endeavors like academic spin-offs and graduate start-ups (Marzocchi, C. et al., 2019).

The study explored how partnerships with startups might affect the adoption of digital innovation in Brazilian manufacturers. Research and development cooperation, open innovation, and Industry are related in the theoretical framework. Four firms that were being fostered at the southern Brazil-based International Innovation Center were the subjects of a qualitative multiple case study. The findings revealed that entrepreneurs heavily utilize open innovation approaches, with sources of knowledge and creativity coming from collaborations with businesses, universities, government development agencies, and incubators. It was discovered that the complexity of the startup innovation ecosystem had been viewed as a strategic asset; and the nature of these partnerships is defined by informal management, along with a startup's still low maturity level. The study provided evidence on the nature, dynamics, and effects of startup collaborations in the growth of digitalization in Brazil, as well as demonstrated the problems and challenges of the industry (Rocha, C. F. et al., 2019). Entrepreneurs in charge of digital companies are frequently encouraged to remain adaptive. Furthermore, there had been studied on how to be pursued flexible tactics and if such techniques enhance short- or long-term digital venture outcomes. Researchers may incorporate exogenous variation in tactics and mentoring features and relate these qualities to venture success over time by exploiting the capacity to change the material presented and to assessed outcomes during a course using a "massive open online course" (MOOC) platform. The findings implied that mentor selection advice, specifically selected for the mentor's social network characteristics and crucial over time for maximizing the benefits of an adaptive approach, especially for digital businesses at their early stages (Eesley, C. E., & Wu, L., 2019).

#### ii. Modern Strategies to Promote Equity of IT Startups

The purpose and significance of a brand, in addition to better differentiating a modern organization's services or products from those of a rival and building a solid reputation, was to safeguard the investments made in the name under which that organization conducted business and to provide the framework for long-term profitability. The study explored brand value-related difficulties of contemporary firms about online presence strategies and analyzed the top ten Romanian companies with the strongest brand values. The study aimed to pinpoint the key factors that, when seen from the utilization of "digital marketing tools and techniques" (DMTTs), help to increase the value of the analyzed businesses. Some remarks are made following the processing and analysis of the findings to consolidate and enhance the present techniques for increasing the value of a brand using DMTTs-type strategies (Niculescu, A. et al., 2019). The customer-based brand equity approach, which emphasized the value of understanding consumer brand knowledge structures, offered to help marketers establish and manage their brands in a marketing communications environment that rapidly changed. The brand resonance pyramid was specifically examined as a way to monitor how marketing communications may foster strong, engaged loyalty connections and impact brand equity. This approach stated that integrating marketing communications entails combining and matching various communication channels to create the desired awareness and image in customers' minds. Also covered the adaptability of interactive, online marketing communications for marketers (Keller, K. L., 2013).

Globalization's accelerating dynamics and escalating market competitiveness forced businesses to deal with a variety of fresh difficulties and possibilities. In addition to the relative importance of physical resources, businesses must adopt contemporary strategies and policies addressing market adaptability and development to

be competitive and profitable. The study aimed to experimentally explore the connection between business value and intellectual capital. Additionally, regression analysis had been used to assess the moderating impact of management ownership (Ahmed, A. et al., 2019). The cutting-edge technology to create new goods and change business models, today's startups are a significant source of innovation. Startups are becoming a more important source of external innovation for businesses that use an open innovation approach. Corporate accelerators provide a powerful strategy for fostering ideas from new firms. Furthermore, the disparities between businesses and startups make collaboration difficult. Corporate accelerators must be successfully developed to bring value to startups and produce innovation advantages for IT startup companies. Supervisors get a framework and tactics for establishing corporate accelerators based on information gathered through interviews with managers and participants in corporate accelerators. Managers must evaluate the design elements of the concept, process, people, and location methodically and deliberately to harness startup innovation and make corporate accelerators a successful component of a firm's broader innovation strategy (Kohler, T., 2016).

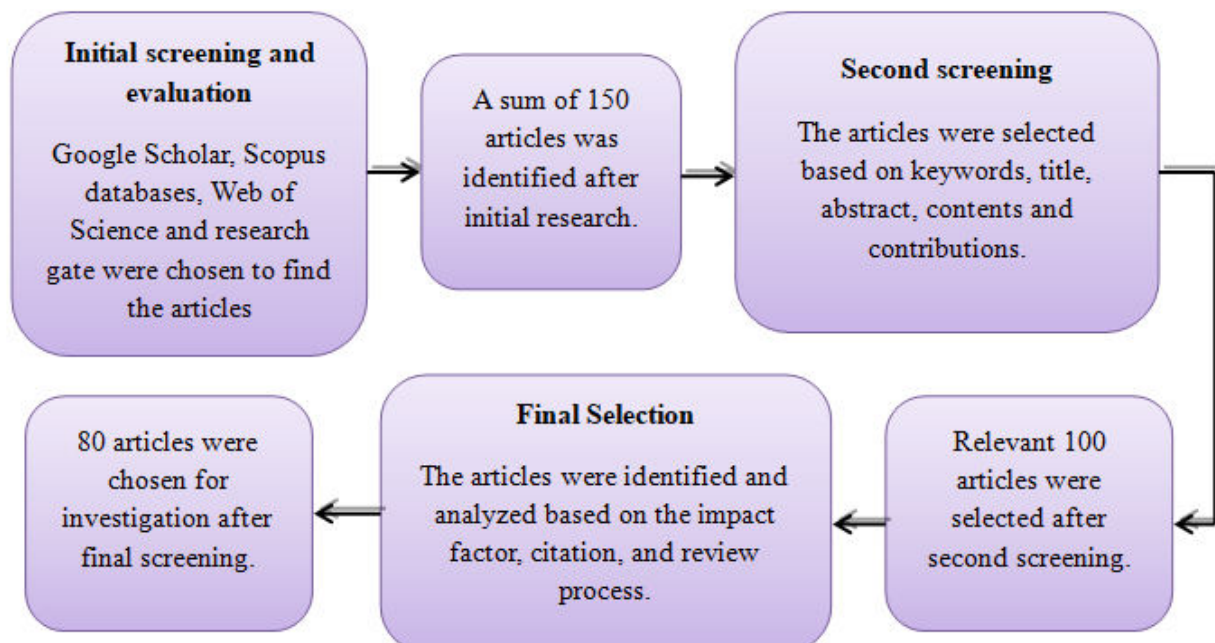
### iii. The Hybrid Working of IT Startups

The study introduced a unique "steam accumulator and concrete-block storage system" (SACSS) to recover some of the energy lost during the beginning of combined cycle power plants (CCPPs) through the steam cycle side. When combined with sensible-heat concrete storage, the steam accumulators produce superheated steam, which results in steam turbine operation that was more efficient and secure than systems that just use saturated steam. A heat recovery steam generator (HRSG) of the "Benson-type" had been used in a "Coal-fired Power Plant" that can start up quickly, whereas a CCPP that used a normal drum-type HRSG had been used in a CCPP that operated with slower initial times. The second scenario was based on data that had been measured, which was worth emphasized. The number of steam accumulator units, the storage pressure, the length of the concrete blocks, and the outside concrete diameter are the four design factors that were focused on the economic optimization of the SACSS (González-Gómez, P. A., et al., 2022). By enhanced the software development parameters such as cost, time, and quality, startups may offer one another interested prospects that foster mutual growth. With the potential to swiftly solve market difficulties, niche talents handled by freelancers might assist startups in reducing market and development uncertainty (and with higher quality). This necessitates long-term, trust-based, and promising agreements motivated by motives in the relationships between freelancers and startups (leading to the growth of both parties). If freelancers were selected with careful consideration, startups may benefit from their ability to stimulate creativity and complete software development jobs more effectively than they could internally. To identify association models, problems, difficulties, and reported findings resulting from such associations, the results are studied and compared. Members verifying with research participants helps to authenticate the study's findings, which demonstrates a better degree of result agreement (Gupta, V., et al., 2020).

Hybrid working is an effort by an IT startup firm to adapt to working because of COVID-19 by combining working from home and working elsewhere. There are several phenomena that employees experience while using the hybrid working system, but the well-being that employees experience when working in a hybrid can have a good influence on the IT startup, including improving employee organizational commitment. The purpose of the study was to evaluate the impact of organizational commitment to hybrid working at digital startups in Daerah Khusus Ibukota (DKI) Jakarta. Convenience sampling is the sampling method employed, and there is 97 Hybrid Working in total. The Walton model from Timossi, L. S. et al., (2008), which had been translated into Indonesian by Wardani, L. M. I., & Anwar, M. S., (2019), had been the measuring tool used to assess the quality of work life. A measuring instrument developed by Ingarianti, T. M., (2015) was used to assess organizational commitment. Andini, T. A., et al., (2022) determined the impact of each aspect of the quality of the work-life on organizational commitment, the analysis method in the study employed multiple linear regression. As per Kuzior, A. et al., (2021) involved freelancers as a source of creative ideas (that increase customer perceived value) and as specialists for implementing innovative ideas, software firms might continually improve their business model value proposition (by undertaking software engineering tasks). Startups had been used one of three ways for collaborated with freelancers: task-based (the affiliation ends after the outsourced activity is completed), panel-based (the task is outsourced to a panel of freelancers linked with the business), or hybrid (Fernandez-Crehuet, J. M. et al., 2020).

### 3. RESEARCH METHODOLOGY

A total of hundred relevant articles were found to be relevant. After an examination of the abstracts, contents, and subject matter, the relevant eighty articles were selected for this review. To improve the overall efficacy of the study, relevant data is collected and obtained.



**Figure 2:** A screening method

#### 4. DISCUSSION

More diverse external information source relationships and industry knowledge, aid to identify not only more (remote) market opportunities, but also more varied (external) market prospects. On the other hand, the founders' technological prowess was less important in affecting the quantity of possibilities than it was in determining the amount to which the strategic diversity of these chances was uncovered (Gruber, M. et al. 2013). The intricacy of the startup innovation ecosystem has been seen as a strategic asset, and the nature of these collaborations is characterized by informal management and a business's still immature stage. The study illustrated the issues and difficulties facing the sector and presented data on the nature, dynamics, and consequences of startup cooperation in Brazil's growing digitalization (Rocha, C. F. et al., 2019). The customer-based brand equity method, which placed a strong emphasis on the need of comprehending consumer brand knowledge structures, provided assistance to marketers in building and maintaining their brands in a quickly evolving marketing communications environment. In order to track how marketing communications may promote solid, engaged loyalty relationships and affect brand equity, the brand resonance pyramid was especially explored (Keller, K. L., 2013). The goal and significance of a brand was to protect the investments made in the name under which that organization conducted business and to provide the framework for long-term profitability, in addition to better differentiating a modern organization's services or products from those of a competitor and developing a strong reputation (Niculescu, A. et al., 2019).

Collaboration is further complicated by the differences between established companies and new ventures. Corporate accelerators must be effectively created in order to benefit startups and give IT startup firms an innovative edge. To capture startup creativity and make corporate accelerators a successful part of a firm's larger innovation strategy, managers must analyze the design aspects of the concept, process, people, and location carefully and intentionally (Kohler, T., 2016). Startups may be able to provide one another with interesting opportunities that promote mutual growth by improving the software development criteria such as cost, time, and quality. This calls for long-term, trustworthy, and promising agreements in business partnerships between independent contractors and startups (Gupta, V., et al., 2020). The effects of each component of the quality of the work-life on organizational commitment were assessed by Andini, T. A., et al. (2022). Startups have utilized one of three methods to work with independent contractors: task-based, panel-based, or hybrid (Fernandez-Crehuet, J. M. et al., 2020).

#### 5. CONCLUSION

When the business model, team building, and market entrance are all addressed, the concept of the strategy in a start-up is getting to the forefront. The startup strategy begins with a diversified prospect, intricacy of the startup, loyalty and brand equity, the purpose and significance of brand, innovation, relationship, work-life commitment integrated into the corporate environment. This concept is then implemented by attitudes and actions. A genuine startup strategy is the course of action used to accomplish objectives while operating under constraints imposed by the environment and rivals. Several users, customers, and income targets have been



stated as four different sorts of start-up tactics or activities, each of which has a different impact on achieving those goals. Because they are young, undeveloped businesses, start-ups strategize differently from larger, more established businesses, but only to a limited extent. Despite being documented using nominally similar criteria, the differentiator, combinator, stuck in the middle, and clever operator strategies outperform strategies according to the conventional Porter typology in terms of accomplishing goals. The collection of standardized methods gives reasonably clear boundaries for the action and behavior of start-ups in a competitive environment, including the result of such an action. It is an original addition to deepening and expanding the knowledge of start-ups. Start-ups, the majority of which are at an advanced stage of development, apply the identified tactics, a sign that the business model is almost complete. They determine their behavior and, naturally, their strategic thinking, but it may be required to monitor their continued growth and assess their stability or alterations. Modern tactics may change in the face of fierce competitors and demanding customers.

Hybrid thinking has generated a new wave of experimentation, with businesses using a variety of solutions and strategies to determine what works best for both people and the firm. This is likely to become a continuous process of discussion, trial, and error, and modification, to achieve alignment between employer and employee expectations. The research demonstrates that a positive outcome is possible for all stakeholders involved if companies plan and implement change meticulously. The workplace has been taught the need for preparation and planning, as well as the need to stay up with technical and management innovations to assure productivity and development. Accepting the hybrid workplace is essential if the future of work is to be prioritized.

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## THE INEFFECTIVENESS OF PROTECTIVE MESSAGES AGAINST COVID-19: A PROBLEM OF PERCEPTION

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### ABSTRACT

*To contain the life-threatening SARS-CoV-2 pandemic, countries worldwide have been issuing miscellaneous public health messages, perhaps based on the untested assumption that such messages must be effective. This study analyses the effectiveness of the dissemination of protective messages against COVID-19 spread. The findings show that the primary factors for poor compliance with the preventive messages include insufficiency or absence of enforceable warnings and sanctions, poor noticeability of the messages, and the inability of the messages to engender accurate perception and awareness of the pandemic. Hence, an urgent need for greater attention to the design of warning messages has become apparent due to the diverse responses of the public. Against an unreceptive population, the success of any regulation becomes contingent on the presence or absence of a significant deterrent or penalty for ignoring rules, especially in times of high social responsibility when the violation of regulations threatens the well-being of society.*

**Keywords:** COVID-19, SARS-CoV-2, Pandemic Signs, Pandemic Guidance, Coronavirus Warnings, Life-Threatening Hazards, Protective Messages, Ineffective Penalty.

### 1 INTRODUCTION

The current pandemic has exposed panic-stricken populations around the world to warning messages and special guidelines worded in diverse shapes, colours and tones. It is generally accepted that language is the primary means of communication to induce earnest reactive behaviour. Accordingly, governments, businesses and other associations displayed prominent danger messages to stop the proliferation of coronavirus and reduce its fatality numbers. The varied types of such warnings ranged from persuasive appeal to exploitation of fear. However, people are still succumbing to COVID-19. At the time of writing, there has been 215,477,312 coronavirus cases and 4,488,570 deaths (as shown on Figure 1), with 18,331,093 active patients. Therefore, displaying warnings and danger messages have proved insufficient for ensuring the public's compliance with protocol guidelines. Moreover, the poor noticeability of the warnings has failed to communicate vital messages and regulations; the regulatory actions appear to have not achieved the intended result.



Figure 1. Coronavirus update (Worldmeter, 2021)

Therefore, this study reviews and assesses the effectiveness of different types of information communication in conveying relevant messages and altering public behaviour towards the desired goal, particularly in the face of life-threatening hazardous conditions such as the COVID-19 pandemic. This study also reviews evidence-based approaches that examine the primary factor for the weak effect of the messages on health behaviour choices. This study is relevant for responses to pandemics now and in the future.

### Pandemic as a Complex System

A small change might make the most incredible difference. Soloviev, Bielinskyi and Kharadzjan (2020) consider a pandemic as a complex system. Sturmberg and Martin (2020) see it as a system in which one small part affects the entire system; they likened it to the idiom, 'it is the last straw that broke the camel's back', to emphasise the accumulative effects of small actions. Similarly, Selin (2021) regards the pandemic as a complex adaptive system. Hence, small changes, such as the one proposed in this study, can lead to large-scale variation in the rate of pandemic fatalities worldwide.

## 2 Assumptions

- COVID-19 is preventable, and prevention involves behaviour, and warning signs should help such prevention. The adoption of a new precautionary measure, such as pandemic regulations, requires conscious behavioural change.
- There exists a gap between intentions to comply with pandemic regulation and performing the intended action(s) forthwith.
- Effective warning messages can reduce those gaps and break barriers for the fight against the pandemic.

## 3 Methods

This study has used visual environmental sampling from public, and then categorising them into groups. Figure 2 shows the wide variability in COVID-19-related public warnings. The pictures were taken in public by incidental observation. Those messages represent a typical variety of the public messages that individuals find when walking outdoor. Most public venues, such as restaurants, supermarkets, bus stops, and train stations, have displayed similar warning messages.

This study categorised the safety warnings into 18 groups. Some groups sought to remind the public of the persistent danger of the virus, whereas others sought to instil fear.

A. Informative	B. Military command	C. Warning

Figure 2. Degrees of warning

D. Health promotion	E. Protect health	F. Improve health

Figure 2. Degrees of warning

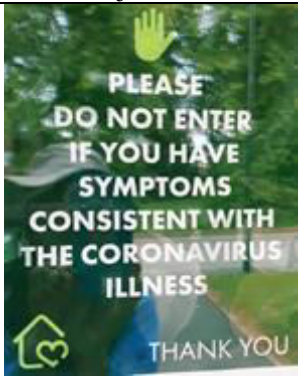


G. Rejection to access	H. Miscellaneous	I. Sense of safety
		

Figure 2. Degrees of warning




J. Business continuity	K. Plenty of instructions	L. Precise instruction
		

Figure 2. Degrees of warning


M. Progressive message	N. Wrong location	O. Polite at the right location
		

Figure 2. Degrees of warning



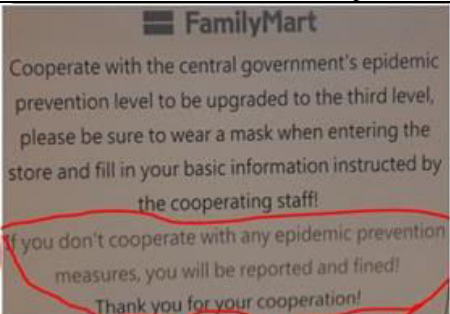
P. Prosecution	Q. Funny design	R. The cost of non-compliance
		

Figure 2. Degrees of warning



Two warnings in Figure 2 attract special attention in this study.

1. Item M reads, 'Washing my hands helps protect **me and you**'.
2. Item R reads, 'Cooperate with the central government's epidemic prevention level to be upgraded to the third level, please be sure to wear a mask when entering the store and fill in your basic information instructed by the cooperating staff! ..... **If you don't cooperate with any epidemic prevention measures, you will be reported and fined**'. This message has additional warnings about paying the penalty if one refuses to obey the regulation.

#### 4 FINDINGS AND DISCUSSION

What makes people care for warning signs? Perhaps they care for dangers that they fear may affect them immediately, or perhaps, they care for danger signs that are simply more visible to the eye. For example, Figure 3 shows two warning signs for potential hazard: a) a very common warning for wet surfaces, and b) a sign for halting the spread of COVID-19. A key difference can be discerned between the two. The latter is more life-threatening than the former. However, people seem to perceive the slippery sign significantly more noticeably than the social-distancing sign. Some reasons might include the evident consequence of ignoring the caution for slippery surfaces, which directly affects the individual; self-interest guides their response (Feldman, 2018). Furthermore, the phrase 'Let's keep a safe distance' does not make individuals perceive the potential suffering or pay any expensive cost for disregarding the warning. The absence of immediate consequence drives individuals to give less attention to the safe-distance warning.



**Figure 3:** Perception of hazards, a) for slippery floor and b) for keeping distance during COVID-19 pandemic

A primary cause of the public's poor compliance with various preventive directives is the lack of clear vision and direction towards encouraging the citizens to obey the government guidelines and healthy behaviour.

Observing the warnings in Figure 2, it is evident that the variety of messages cannot show the same degree of success in impacting people to accept the regulations or changing an individual's behaviours to match the desired attitude. Nor can they attribute the same meaning to all sets of messages. The referent of all COVID-19-related messages seems to remain unclear. Nonetheless, it is fundamental to create attractive messages by improving the wording, design, colours, shapes, foreground and background of the public messages. However, the gravity of the pandemic seems to demand stronger communication.

Item R in Figure 2 – which reads, 'Cooperate with central government's.... **If you don't cooperate with any epidemic prevention measures, you will be reported and fined**' – may present a rather overly-wordy warning without attractive colours or pictures, but it does promise strong penalty for ignoring the regulations.

Item M reads, '**Washing my hands, helps protect me and you**'. The wording of this message convey a positive and progressive invitation to comply with the regulations, which might be more persuasive than other types of messages. However, in the context of severe circumstances, this type of positive wording might not have high impact.

In the following subheadings, this study shows the approaches to consider when designing warning signs.

##### Language Effects

Words in warnings are crucial for drawing attention to danger. Appropriate wording in warning messages that fit the target population and matches the situation, such as the pandemic, can move people into action, touch their thoughts, and influence how they perceive and respond to events. Choosing the right words for the messages delivers ideas effectively because language affect people's understanding of the intended idea. For example, take the expression 'social distancing' in Figure 4 and many others from Figure 2 for maintaining physical space in public. Some scholars have been questioning this phrase as it might be contributing to social isolation (Aminnejad & Alikhani, 2020; Wasserman, van der Gaag, & Wise, 2020). They argue that the

expression ‘physical distancing’ is more appropriate than social distancing in the context of a pandemic. Physical distance does not deny the human connection via alternative means such as video chats with family and friends. In addition, physical distancing seems to reinforce the need to stay at least two meters apart in public.



**Figure 4:** Social distancing or physical distancing?



### Context and Awareness

Examining the “wear a mask” messages in Figure 2, the shops recommend wearing a mask, but it is optional. Knowing that it is not mandatory, people might make excuses for not wearing a mask by referring to side effects: breathing discomfort, mumbling pronunciation, itch causing, perspiration and moisture around the mouth (Matusiak, Szepietowska, Krajewski, Białynicki-Birula, & Szepietowski, 2020). The environment where people are born, live, learn, work, play and worship seems to affect health choices and awareness of hazards. Tan, Wang, Luo and Hu (2021) have shown that 99% of Chinese used a face mask during the viral pandemic, with 73.3% of people using the face mask properly, such as proper hand hygiene before and during the mask-wearing period. In contrast, in some countries, such as Peru, Ecuador and many others, the current generation might not have ever experienced or even heard of any pandemic before the current coronavirus. Hence, they might not have formed conscious opinions about it. It might be humanly impossible for an individual unaware of the pandemic to perceive the invisible, severe danger immediately. In this case, what type of message do they need to hear to make them aware of their behaviour’s consequences? Effective messages can allow individuals to perceive the danger and the cost, the pros and cons of the products of their behaviours. If the message is

ineffective, a warning message might even produce an attitude in the direction opposite to the intended change. Prior knowledge in the context is a decisive factor when designing a warning sign and perhaps leads to stronger enforcement actions. Hence, it is vital to the compliance of regulations and warnings that we understand why.

We argue that although words such as lockdown and curfew are military terms, they do not magnify the severity of the danger unless they are taken into local equivalent terminology. To translate, they need to find their local word equivalents, ones that are easy to pronounce, and which the local people already understand. Every region needs to develop prudent plans in harmony with its context (Perez & Alieto, 2018).

Effectiveness of information presentation tailored to a target community group should come from the governments or authorities after scrutinising the achievable and practical intervention, understanding the citizen's perceptions of the messages and how science, such as neuroscience, shows that the words, colours, design and channels in language alter behaviour.

### **Ostrich Effect**

Scary messages might lead people into inaction and even might ignore scary negative messages. This result, called 'the ostrich effect', is the tendency to pretend that negative information does not exist (Bernard, Cade, & Connors, 2020; Gabriel, 2019; Karlsson, Loewenstein, & Seppi, 2009). For example, the ostrich effect can cause an individual to ignore their bills because they have not paid them, or a businessperson threatened by a fall in revenue might prefer to stay unaware. People prefer to take the information they want to hear; otherwise, their brain frantically try to distort the meaning of the information. During COVID-19, people being flooded with diverse types of horrifying news might have succumbed to the ostrich effect and pretended that those dangers did not exist; people are much more willing to listen to positive information or acknowledge positive images, as the one in Figure 2 (M).

### **Progress Monitoring**

It is claimed that the brain is reluctant to process negative information about the future. People prefer to hear the desirable future events but not the sobering downturn. In other words, they underestimate the prospect of undesirable events; some scholar has named this phenomenon as 'progress monitoring' (Jefferson, Bortolotti, & Kuzmanovic, 2017). For example, it might be better to say 'stay at home so that we can play soccer in 20 days' instead of 'stay at home, stop spreading the virus'. This judgemental bias leads to efficient coding of positive information about the future (Jefferson et al., 2017; Sharot, Korn, & Dolan, 2011). Hence, it might be worth expressing the message with progressive orientation rather than denying access or showing negative expressions, as depicted in item M of Figure 2.

### **Intention Vs Behaviour at the Cognitive Level of Analysis**

Someone intending to act should have a cognitive representation of the circumstance where one is immersed, so one is cognizant of the situation in which his intentions, decisions and actions are happening. However, the requirements of knowledge for obedience seems not to correlate with intention in the act of obedience. Moreover, actions seem not to be only a function of intentions, and intentions seem not to always correlate with behaviours (Gardner, Lally, & Rebar, 2020). For example, good intentions do not necessarily guarantee corresponding actions; instead, habits might play a more vital role in choosing certain actions. Hence, the processes that mediate between the intentions and the behaviour belong to the cognitive level of analysis, sensitising citizens to hazards, actively processing information. There is a need to make people become aware and react to issues, such as the pandemic.

### **Video Monitoring Experiment in a Hospital**

Live and remote video monitoring have been actively involved in not only the safety enforcement security in industrial and commercial properties (Ajenikoko et al., 2020) but also in ensuring compliance with hygiene regulations at hospitals, promoting healthcare worker to react in real time. There was a research experience assessing the healthcare worker compliance with hand hygiene before and after entering the patient room using remote video auditing (Armellino et al., 2018; Armellino et al., 2012; Pedersen, Getty Ritter, Beaton, & Gibbons, 2017). They found that remote video auditing with feedback produces a significant change in habits and behaviour. In this vein, video auditing obtains the desired health change behaviour, reassuring that hand hygiene is always a key to preventing infections. Thus, video auditing might also constitute an effective way of assurance compliance during pandemics, at least in venues of high social responsibility.

### **Warning by Using Fear**

The use of fear might change behaviour by using scary warnings. Some researchers show that threats and warnings can alter behaviour in certain contexts (Nabi & Myrick, 2019), under the assumption that inducing fear triggers people to act and reduce fear (Simpson, 2017). As an illustration, this strategy using fear telling

people COVID-19 can kill infected people might be ineffective in many contexts. This might remind readers of the shaping of children's behaviour in some families by using fear with the threat of stick and its usually ineffective results. Further, Ruiter, Abraham, and Kok (2001) have already revealed that fear-based messages have a limited impact on motivating the desired action. For example, it is common to find a warning on alcoholic beverages. 'Excessive consumption of alcohol is life-threatening and is detrimental to health'. However, this message is said to be ineffective in deterring people from consuming alcohol. Therefore, in some contexts the use of fear to stop the spread of pandemic might be acceptable and have a quick effect to make people aware of the gravity and severity of the danger.

### **Good News over Negative News**

Furthermore, other studies showed people of all ages consistently tends to learn and obey good news or positive news (Moutsiana et al., 2013). They have also concluded that young individuals until the age of teens can accept and obey negative news or threats to alter behaviour. In other words, an adolescent might also accept and learn from negative news. This tendency might explain why most adolescents engage in risky behaviour. Hence, if the future feels more depressing than expected, teenagers take the risky plunge. They explained that younger age was associated with inaccurate learning from information. In contrast, the ability to learn from the information indicating that the future is brighter than predicted was stable at all ages (see Figure 1). Specifically, accurate updating in response to bad news improved linearly with development in the age range tested but stayed relatively constant in response to the good news.

### **Social Incentive**

Moreover, another motive for changing behaviour is the social incentive. A common example would be praising pupils in the class instead of giving them higher scores (Dorfman & Grossmann, 2020; Edelson, Sharot, Dolan, & Dudai, 2011); humans pay close attention to what others are performing. For example, we might indicate that nine people out of ten comply with the COVID-19 regulations. This message can make people feel immersed in socially valued and approved conduct.

### **Immediate Reward**

People with a negative worldview prefer immediate rewards because they do not envisage a great result over time. (Kim, Kim, & Kim, 2020). Hence, another approach to help people, in some contexts, and to take positive actions to stop the spread of a pandemic might be using an immediate reward. Edelson et al. (2011) also showed that people are more likely to choose an immediate reward and short term happiness, right in the present moment instead of waiting for the future. Reward systems can trigger people to engage in action. It tends to be more desirable when such motivation is immediate. This behaviour might be useful for lockdowns for a certain population.

### **Aesthetic and Colours Capture the Attention**

Colours are said to increase the attentional level and even influence psychological response (Sun et al., 2020). An individual's perception of colour code for attractiveness might play a role in the success of the given message. Colours are also said to convey aesthetics, information, mood and ambience; hence, effective use of colours in messages can indubitably attract attention. However, the choices for the features are contingent on culture; for example, red, yellow and black relates to the assessment of the beauty of Chinese women (Warburton, 2018). For another example, white is the colour of a wedding in Europe, whereas it is the colour of death in Chinese society. This cultural factor creates a challenge for megacities and metropolises, albeit colours embedded into the message are of paramount importance. There is a popular example in a business field, the semantics of colour can affect its orientation. As a further illustration, contemporary green marketing – to benefit the consumer and the environment – has introduced new vocabulary, such as green products, green consumers, green goal, green price, green distribution, green promotion and green practices (MAKSUDUNOV & AVCI). Such dimension intends to alter business and consumers attitudes to minimise harmful impacts on the environment and cause less harm to society. In this context, coronavirus colours to denote danger can contain the spread of coronavirus pandemic. Red is said to convey the meaning of stop, and amber, that of caution, or a reddish shade to signal the highest alert. It might be advisable to use a colour-coded emergency alert system related to each community during the pandemic.

Neuroscience has added some valuable insights on the complexity and nuance of subjective aesthetics experience of humans and the location of brain regions for aesthetic pleasure or neuroaesthetics (Iigaya, O'Doherty, & Starr, 2020; Zotov, Korolenko, Mishin, & Ryzhikova, 2019). Therefore, the opposite reaction – reaction to abhor COVID-19 existence and the protective reaction – should also originate in the brain. Such understanding will help create more effective messages to alter human attitudes towards pandemics.



Jortberg (2021) argued that for people to process messages, catching their attention is imperative; and that novelty in using colours, shape and size is of paramount importance. And Yu, Chan and Salvendy (2004) found that the shape enclosing the wordings plays a significant role in conveying the hazard level to the targets. Further, neuroscience has provided a heuristic outlining how the nervous system processes sensory signals to yield behaviour (Chatterjee, 2011; Conway & Rehding, 2013). Insofar as beauty is a product of the brain, correlations between brain activity and beauty experiences must exist. The attitude towards the colours to convey messages allows the targets to associate some aesthetic emotions with the information presented and alter behaviour. Hence, colours in warning signs can attract attention to process and understand the pandemic warning messages.

### **Stages of Healthy Behaviour**

Adopting health-enhancing behaviours requires commitment. Several scholars have explored at least five or six stages of health behaviour change that progresses from unawareness or under-awareness of the consequence of the problems, called pre-contemplation stage, then move to contemplation stage or awareness about the existence of the problem, so that they prepare to take action. Afterwards, they modify behaviour and maintain the new behaviour (Bamberg & Schulte, 2018; Moreira, Faria, Cunha, Inman, & Rocha, 2020; Sachdeva, 2019). This research suggests that health behaviour changes are processes requiring a considerable commitment of time and energy. Therefore, there is a need to design warning messages that accelerate regulatory compliance in a pandemic.

### **Decision-making**

Teovanović et al. (2021) shown that people with irrational beliefs were less likely to comply with the official rules related to COVID-19. Reflecting on decision making from routines, such as how people decide which coffee to have and how much caffeine they would need, to regulatory compliance for the hazardous flames of COVID-19, suggest that decision-making is neither always rational nor always scientific. People seem not to think about the healthiest option at all times. Therefore, not surprisingly, researchers concluded that effectiveness in decision-making involves efforts to change thinking patterns and understanding of how distorted perceptions contribute to painful feelings, combined with the immediate rewards for desired changes in behaviour (Verdejo-García, Alcázar-Córcoles, & Albein-Urios, 2019). Further, at the lower analysis level, other researchers explained that the neuropsychological process guides a person's emotions, thoughts and behaviour (Liu, Liu, Chen, Jiang, & Shang, 2019). In this vein, it might be safe to conclude that people make realities out of ideas presented to them as a function of their culture and belief and are unlikely to occur outside of conscious awareness. Consequently, compliance involves efforts to change patterns.

Much of the research work concerned with the relation between irrational decision-making and guidelines for persuasion has concentrated on lifestyle and business. Maffetone and Laursen (2019) have shown that beliefs influence individual lifestyle decisions. For example, these authors proposed that belief in marketers affects food and lifestyle choices even when the display seems 'too good to be true' and do not necessarily follow guidelines for healthy options. Julmi (2019) found a similar pattern in finance and business. Therefore, the obligatory sense of the messages with costly penalties might help people make an effort to perceive the severity of the pandemic hazard and act upon it.

### **Effectiveness of Messages and EEG**

Some studies have used cognitive neuroscience techniques to examine the effectiveness of messages, including EEG, GSR and HR (Piwowarski, 2017). They have used such methods to enhance objectivity based on what is activated in the brain while making decisions related to social advertisement. They concluded that messages' effectiveness requires elaborating the appropriate messages for recipients.

### **Fear of Triggering Behaviour Change**

There is no need to use the gradual development of health patterns of behaviour in certain situations but requires some forceful action instead. In such cases, using the fear-inducing method might have an immediate effect (Nabi & Myrick, 2019). A fear appeal is a message to arouse fear to alter behaviour using the threat of danger, for example, death (Wall & Buche, 2017). However, these scholars and others share the view that fear appeals have a limited value.

### **Clear Procedure**

The desired change in behaviour requires explicit instruction on how to achieve the desired action. For example, if a government announces a lockdown, it requires a detailed plan, such as when, how, where, and what to do. Some would choose screenings to check for health conditions before any signs or symptoms arise. Generally, when it is easier to treat. Many avoid exposure to risks that might increase the chances that an individual incurs infection.

### Removing Fomites Even though it Might Be Part of the Essential Needs

Essential service stores, such as grocery stores and supermarkets, have remained open throughout the pandemic, regardless of lockdown.

While each context might need to determine their essential goods during a pandemic, some food such as shown in Figure 5 - sweet potato, has been removed from the store to reduce the touch of fomites. The wording in Chinese translates approximately to '... to provide more security; no service provides temporary ...'- sweet potato is removed from the store. The reason is that essential food is also part of fomites. This contribution is an example of careful consideration of helping to stop the spread of the pandemic.



**Figure 5:** Removing essential goods, but fomites

### Neuroscience and Punishment

Further, relevant research done in neuroscience reveals, specifically in the mesolimbic pathway, that positive reward triggers a reward signal in the brain (Settell et al., 2017), so they perform the action; but punishment is effective when trying to deter people from performing actions (Palminteri, Khamassi, Joffily, & Coricelli, 2015), for example, discouraging people from gathering in a crowded area during a pandemic. When humans expect a reward, our brain initiates a green go-ahead signal. In contrast, to avoid punishment or negative events, individuals try to accommodate the circumstance to avoid acting by triggering a sign of cautiousness in their brain, even to the extent of freeze response (Field, Beeson, & Jones, 2015).

### 5 CONCLUSIONS

COVID-19 is preventable, and prevention involves behaviour, and thus warning signs should help such prevention. The review concluded that displaying COVID-19 warning is insufficient; the cost or penalty for ignoring regulations that threaten the well-being of society is what is necessary. The study also concluded that instead of using the threat of coronavirus spread and danger, using a positive message seems to contribute to rising compliance rates. Some other suggestions include providing immediate positive feedback.

Hence, warning signs and their enforcements are two components that go hand in hand and must coexist in almost all contexts. Its concomitant attributes such as wordings, shape and colours are context dependent. Warning signs and their enforcements are essential aspects of any warning sign design that will help people perceive a deeper understanding of their actions, thereby helping them to overcome the ordeals of a pandemic.

### 6 FUTURE WORK

Neurobiological evidence might be helpful in further work to understand better how people perceive the effectiveness of warnings and messages. For example, some messages might make people freeze; others make them flee from certain threatening information, so a threshold must exist that triggers the response in the brain.

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**COMPLICATIONS OF MANDIBULAR FRACTURE**

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**ABSTRACT**

*Mandibular fracture, also known as fracture of the jaw, is a break through the mandibular bone. In about 60% of cases the break occurs in two places. It may result in a decreased ability to fully open the mouth. Often the teeth will not feel properly aligned or there may be bleeding of the gums. Mandibular fractures occur most commonly among males in their 30s. Mandibular fractures are typically the result of trauma. This can include a fall onto the chin or a hit from the side. Rarely they may be due to osteonecrosis or tumours in the bone. The most common area of fracture is at the condyle (36%), body (21%), angle (20%) and symphysis (14%). While a diagnosis can occasionally be made with plain X-ray, modern CT scans are more accurate. Immediate surgery is not necessarily required.<sup>[1]</sup> Occasionally people may go home and follow up for surgery in the next few days. A number of surgical techniques may be used including maxillomandibular fixation and open reduction internal fixation. Before any definitive treatment of mandibular fractures, the patient needs to be evaluated for more potentially life-threatening injuries. Complications can and do occur with treatment of mandibular fractures and can occur during any of the phases of treatment. The development of an accurate diagnosis and appropriate treatment plan is vital in achieving optimal success and decreasing complications. Knowledge of the anatomy and the principles of bone healing is also an important factor in preventing complications. To limit long-term untoward effects, complications should be recognized early and the appropriate treatment should be started before a minor complication becomes a complex one that is more difficult to manage.*

*Keywords: Mandible, fracture, complications, fixation healing, teeth*

**INTRODUCTION**

Mandibular fracture, also known as fracture of the jaw, is a break through the mandibular bone. In about 60% of cases the break occurs in two places. It may result in a decreased ability to fully open the mouth. Often the teeth will not feel properly aligned or there may be bleeding of the gums. Mandibular fractures occur most commonly among males in their 30s. Mandibular fractures are typically the result of trauma. This can include a fall onto the chin or a hit from the side. Rarely they may be due to osteonecrosis or tumours in the bone. The most common area of fracture is at the condyle (36%), body (21%), angle (20%) and symphysis (14%). While a diagnosis can occasionally be made with plain X-ray, modern CT scans are more accurate. Immediate surgery is not necessarily required.<sup>[1]</sup> Occasionally people may go home and follow up for surgery in the next few days. A number of surgical techniques may be used including maxillomandibular fixation and open reduction internal fixation. Before any definitive treatment of mandibular fractures, the patient needs to be evaluated for more potentially life-threatening injuries. Complications can and do occur with treatment of mandibular fractures and can occur during any of the phases of treatment. The development of an accurate diagnosis and appropriate treatment plan is vital in achieving optimal success and decreasing complications. Knowledge of the anatomy and the principles of bone healing is also an important factor in preventing complications. To limit long-term untoward effects, complications should be recognized early and the appropriate treatment should be started before a minor complication becomes a complex one that is more difficult to manage.

The mandible is a prominent bone of the face and because of this; fractures of the mandible are common facial injuries. The presence of the mandible contributes to good facial appearance, biting, swallowing, chewing and speaking. Injuries to the mandible which result in fractures are common both in peace and war times. Sometimes, these fractures are associated with a significant number of complications. Although the mandible is the most commonly fractured facial bone, complications related to management are relatively infrequent despite an inhospitable milieu. Before any definitive treatment of mandibular fractures, the patient needs to be evaluated for more potentially life-threatening injuries. Complications can and do occur with treatment of mandibular fractures and can occur during any of the phases of treatment. The development of an accurate diagnosis and appropriate treatment plan is vital in achieving optimal success and decreasing complications. Knowledge of the anatomy and the principles of bone healing is also an important factor in preventing complications. To limit long-term untoward effects, complications should be recognized early and the appropriate treatment should be started before a minor complication becomes a complex one that is more difficult to manage.

A complication is a problem that arises as a consequence of an initial condition or as a result of treatment. Because of its prominent position in the facial skeleton and the complex nature of the anatomy and environment in which it resides, the mandible is extremely susceptible and thus frequently fractured when a traumatic insult is directed at the face. In addition, the anatomic architecture and presence of teeth create inherent areas of weakness and place the mandible at further risk for fracture. Complications involving mandibular fractures are a consequence of a myriad of factors. As such, they may be secondary to the original injury, a result of the subsequent treatment, or, in some cases, a result of failure to render treatment. Complications of mandibular fractures have an increased relevance because of the important role that the mandible plays in the establishment of occlusion, function, and facial esthetics.

Complications can present as an immediate problem at the time of injury, or they can become manifest during the operative or postoperative phase of treatment. Postoperative complications can become evident early on or sometime after treatment has been instituted. In fact, some problems may not become evident for months or years after the injury. Complications of mandibular fractures can involve the entire spectrum, ranging from minor complications with little residual consequence to those having dire consequences with long-term deficits and even death. However, successful management is still dependent on precise anatomic alignment of the occlusal relationship, accurate adaptation, and precise rigid fixation of the bony segments.

This article will review the major complications involved in the care of mandibular fractures including problems with bony healing, infection, loss of teeth, malocclusion, residual facial deformities, nerve injuries, and resulting temporomandibular joint (TMJ) problems.

### **Immediate Complications**

Because of the size, shape, and thickness of the mandible, any insult sufficient enough to cause a fracture of the mandible can readily result in concomitant intra-abdominal, intrathoracic, intracranial, or cervical injury. In addition, it is not unusual to have simultaneous significant soft tissue injury resulting in significant edema and copious hemorrhage with the potential for airway compromise or hypovolemic shock. Although in many instances of mandibular fracture, the oral and maxillofacial surgeon is consulted after the patient has been evaluated and stabilized by the trauma team or emergency department staff, it still behooves the sagacious practitioner to evaluate the patient appropriately for problems that may be life threatening, and thus take priority over the maxillofacial injury. Appropriate consultation with suitable imaging should be obtained if any of these more imperative injuries are suspected.

### **Airway Compromise**

Airway compromise may be a direct result of the mandibular fracture attributable to swelling, bleeding, foreign body aspiration, or amount of displacement, in addition to the nature of the fracture. The amount of swelling is a consequence of the severity of the injury and the degree of soft tissue involvement. Swelling can be decreased by the use of steroids immediately after trauma unless contraindicated by the patient's medical history or current condition. Preliminary reduction and immobilization may be necessary in severely displaced fractures or in the situation of bilateral body fractures because of the lack of anterior support for the tongue with prolapse to the posterior pharynx and subsequent airway compromise. The use of an oropharyngeal airway in the unconscious patient or bilateral nasopharyngeal airways in the conscious patient may help to alleviate airway compromise. In cases of severe compromise, intubation or tracheotomy may be required. Airway problems associated with concomitant intrathoracic or intracranial causes should be addressed by the appropriate surgical specialty before attempting any treatment of the mandibular fracture.

### **Bleeding**

Although soft tissue or osseous bleeding is not uncommon, significant hemorrhage after mandibular fractures is a rare occurrence. If the trauma results in transection of a major vessel within the bone or the surrounding soft tissue, hemorrhage can be severe with life-threatening consequences because of the potential for hypovolemic shock or hematoma leading to airway compromise. Arrest of bleeding should be attempted by local measures initially; if such measures are unsuccessful, isolation and ligation of the offending vessel should be entertained. The application of initial reduction and temporary fixation may be helpful in stopping or decreasing bleeding because of its resulting tamponade effect. In rare cases, embolization of the offending vessel or external carotid artery ligation may be required.

### **Loss of or Damage to Teeth or Bone**

Because of the vulnerable position of the teeth, a fracture of the mandible is frequently associated with concomitant injury to the teeth or alveolar bone. Teeth can be fractured, mobilized, or avulsed when a mandibular fracture occurs. This may require debridement, fixation, extraction, or endodontic therapy. Because

establishment of correct occlusion is the sine qua non to treating mandibular fractures successfully, the loss of teeth or alveolar bone fracture may compromise reduction of the mandibular fracture and may necessitate an open rather than closed procedure or construction of a surgical stent. Teeth that become nonvital during the healing phase can cause infection and interfere with fracture healing. It is suggested that all compromised teeth be treated early to lessen the chance of this occurring. Questionable teeth in the line of fracture have special relevance and are addressed in another article in this issue.

## **DELAYED COMPLICATIONS**

### **Nonunion**

A nonunion is the lack of osseous union by two or more fracture segments after the usual 6- to 8-week healing period. Fortunately, nonunion of mandibular fractures is not a common occurrence. In some instances, no additional treatment is required because the nonunion responds to conservative management consisting only of an increased period of immobilization. This is particularly evident when there is limited bone volume or the patient has a decreased healing capacity attributable to age or concomitant medical conditions or medications. If conservative management is not successful, a second surgical intervention for correction may be required. There are many reasons why a fracture does not go on to bony union, including interference in the reduction or immobilization of the fracture and the development of infection with a resultant loss of bone. (1) Inadequate reduction with a gap between fracture segments or the interposition of soft tissue that prevents bone-to-bone contact can cause a nonunion. Excessive mobility has the propensity to prevent the initial callus formation necessary for subsequent bone formation and maturation that may go on to develop a fibrous union. In the case of closed reduction, this may result from inadequate or loose intermaxillary fixation causing macromovement of the fracture segments. For complete or partial edentulism, an insufficient number of teeth may be available for adequate immobilization and a surgical stent may be necessary for to prevent or minimize mobility. In contaminated cases or those treated by means of an open approach, infection may act as the causative agent in causing a nonunion. When rigid fixation is used, infection can result from screw loosening with subsequent fracture site mobility. Infection can also result in the destruction and loss of bone at the fracture site with a lack of bony contact, and thus the inability to form an osseous union. In addition to infection, large gaps can be caused by loss of bone because of the nature of the injury, as is frequently seen with high-energy wounds.

Additional causes of mandibular complications are impacted teeth present at the fracture site that require removal for adequate reduction and pathologic entities, such as cysts or neoplasm. The patient's age and systemic health may also play a role in the development of a nonunion. The elderly patient has a greater chance of a nonunion for two reasons. An elderly patient's reduced ability to form a bony union may be attributable to a decrease in age-related healing factors, and there is often a decrease in bone height and width attributable to the normal resorptive process that occurs with loss of teeth and aging. This lack of bone quality and quantity compromises the vascularity of the bone, further complicating healing. (1) Any concomitant medical or systemic condition or medications that the patient may be taking can result in a nonunion by altering or interfering with the natural healing potential of the body.

The treatment of nonunion depends on the cause and the resultant deformity or defect. In most cases, an open procedure is required to visualize the fracture and to remove any tissue present between segments. After all soft tissue or infected material is removed; the patient is placed in occlusion with maxillomandibular fixation while the fracture is reduced. If there is good bone-to-bone contact, the fracture segments are rigidly fixated. In the event that bone has been lost because of infection or loss of vascularity, the ends of the fracture segments are freshened to reveal vital bleeding bone and a bone graft is placed between the segments if infection has resolved with the placement of a bicortical reconstruction plate.

### **Malunion**

Malunion occurs when fracture segments are not properly reduced or fixated, and bony union takes place in a less than ideal position. An important way to decrease this complication is to place the patient carefully in the appropriate occlusion before any surgical intervention; at that time, the fracture is reduced and fixated. Many times, a malunion manifests clinically as a malocclusion, an inability to function normally, and, in some cases, an obvious facial deformity. A malunion can occur because of a poor treatment plan; surgical error; or when there are missing or carious teeth, multiple fractures, or concomitant alveolar fractures that prevent the establishment of the proper occlusion. The correct treatment plan (ie, open versus closed reduction), external appliances, or stent construction should be based on the degree of fracture displacement, the location, the amount of bone loss or comminution, and the lack or presence of a sufficient number of teeth to establish adequate occlusion.



In terms of statistics, mandibular fractures complications have been evaluated on the basis of the country and the socioeconomic condition of the people. (2) Commonly reported complications associated with mandibular fractures include infection, malocclusion, nonunion, delayed union, as well as neurological deficits. Several factors have been shown to influence complications associated with mandibular fractures. Amongst them include, patient's age, patient's lack of compliance, duration of antibiotics use, severity and number of fractures, mandibular bone quality, and dentition.(3) Some authors,(4) however, feel that the modality of treatment play an important role in the development of these complications.

The use of wire osteosynthesis and maxillomandibular fixation (MMF) has decreased considerably in the western and other developed countries because of the disadvantages associated with them. Intraosseous wiring prevented distraction; however, it does not provide sustained interfragmentary compression.(5) This, among other reasons, led to increased preference for open reduction and internal fixation with miniplates. This has helped reduce malocclusion, nonunion, improved mouth opening, speech, decreased weight loss, and increased the ability for patients to return to work earlier.(3)

The incidence of malocclusion was slightly less in open reduction (5.13%) compared to closed reduction (6.67%). As expected, malunion was less in open reduction (5.13%) than in closed reduction technique (8.33%). The reason for these observed differences may probably be due to direct visualization of the fracture site in open reduction as opposed to the blind procedure associated with closed reduction technique with resultant inadequate reduction and fixation of fracture resulting in indirect healing at the fracture site. (6)

Dysphagia which was thrice as common in open reduction (56.41%) as in closed reduction technique (16.67%), possibly due to endotracheal intubation, was not considered significant as it acted as a cofactor in the rate of complication. The same can also be said of poor oral hygiene with complication rates of 55 and 51.28% for closed and open reduction techniques respectively, possibly due to the presence of archbars and dental wires thereby resulting in difficulty in maintaining a good oral hygiene. (6)

In general, the method of IMF for treating mandibular fractures is simple, easy to learn and still widely practised in most of the maxillofacial surgery. On the other hand difficulties associated with prolonged period of immobilization include airway problems, poor nutrition, weight loss, poor oral hygiene, difficulty in speaking, social inconvenience, patient discomfort, work loss, and difficulty in recovering normal range of jaw function. An excellent review of the deleterious effects of mandibular immobilization on the masticatory system is provided by Ellis (7)

Indications for open reduction and internal fixation of mandible fractures include most symphyseal and parasymphyseal fractures, displaced body and angle fractures, and certain condylar fractures, displaced body and angle fractures, and certain condylar fractures. Non- rigid osteosynthesis utilizing intra- osseous wires, and K wires, however, takes place over 4-8 weeks. Moreover, the fracture site however, is not rigidly fixated and an element of movement does occur which in certain cases may predispose to healing by fibrous union.

In an urban area with a high prevalence of poor living conditions, substance abuse, and poor patient compliance, the treatment of mandibular fractures by closed reduction resulted in the least number of postoperative complications in all anatomic regions of the mandible. The mandibular angle fracture had the highest overall morbidity rate. Even with best efforts, unsatisfactory results such as non-union, malocclusion and facial asymmetry occur during the management of mandibular fractures. A clear understanding of the nature of these post traumatic mandibular deformities helps to avoid them. Furthermore, the clinician should be familiar with the reoperative technique used for the management of these deformities.

## **CONCLUSION**

High levels of success can still be achieved using available materials in the form of arch bars, eyelets and wire osteosynthesis in the treatment of mandibular fractures using either the closed or open reduction technique in resource poor settings despite the advent of miniplate osteosynthesis. Although the complications recorded in this patient population were managed during postoperative follow-up period, the methods of treatment available give good results, are cost-effective and patient compliance is good. This suggests that the older methods of treatment of mandibular fractures can still be used with reliability in contemporary dental practice.

## **CONFLICT OF INTEREST**

The author declares that there is not conflict of interest

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**SIMULATION OF SPOT WELDED WIRE MESH BASE OF STORAGE BIN FOR ONION WAREHOUSES**

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**Ammar Bagdadi<sup>1</sup>, Dr. Ajay Gangrade<sup>2</sup> and Prof. Vijay Bhosale<sup>3</sup>**<sup>1</sup>PG Student and <sup>2,3</sup>Professor, Mechanical Engineering Department, K.J. Somaiya College of Engineering, SVU, Vidyavihar, Mumbai- 400077, India**ABSTRACT**

*Onion is perishable commodity and vulnerable to changes in climatic conditions. Hence, government and policy makers are in favor of employing the warehousing systems for onion. Upon surveying such facilities, it was observed that major portion of setting up these storage structures goes into building bins/ containers to store these onions. Major factor which affects the shelf life of onion is unscientific handling, heavy staking and poor ventilation system. Further, it was found that very less scientific caliber is applied while designing staking system for onion warehouses. Ideal staking system should be able to consider ergonomics and man-machine interaction, cost effective solution and reduced labor efforts for loading and unloading of onions. The Stacking system should be able to carry high amount of load. It is necessary to carry out experimental as well as analytical analysis for the wire mesh grid because the whole weight of onions is acted on it. The Static Analysis for wire mesh was carried out and it was found out deformation was under permissible limits. The software used was ANSYS.*

*Keywords: Onion, Static Analysis, Wire Mesh, Stacking System.*

**1. INTRODUCTION**

Since wild onions are no longer present, little is known about their origin. Onions were reportedly employed thousands of years ago in China, Persia, and Egypt, according to historical sources. The European settlers brought onion farming to North America initially. However, before the advent of the Europeans, the locals were already using wild onions, either raw or cooked, in many sorts of dishes.

Onions are abundant in dietary fibre and vitamin C. Quercetin, a flavonoid found in onions, is an antioxidant that the body uses. Onions may provide a number of health advantages, mostly because of their high antioxidant and sulphur-containing chemical content.

They have anti-inflammatory and antioxidant properties and have been associated with enhanced bone health, lower blood sugar levels, and lower cancer risk. The main nutrients in onions are water, carbohydrates, and fiber. Although their primary fibers, fructans, may cause digestive issues in some people, they can feed the good bacteria in your stomach. Onions are a good source of vitamin C, folate, vitamin B6, and potassium, all of which have numerous health advantages.

**1.2 Organization of Paper**

This paper is divided into various sections. Section 1 has covered introduction of the entire topic. Section 2 covers literature survey part in which Research findings and Research gaps are assigned with the sub-sections. Section 3 covers Methodology & Analysis. Section 4 is conclusions drawn on the basis of study and future scope of current study. At the end, references of the articles selected are provided.

**2. LITERATURE SURVEY**

Literature survey for this report using Scopus database peer reviewed research articles only. Research papers are selected from 2005 onwards. Articles are selected from reputed Journals like Electronics, Biosensors, Journal of Advanced Agricultural Technologies published by reputed publishers by like Taylor and Francis, Springer, Elsevier etc.

20 articles were selected on the basis of TAK (Title, Abstract and Keywords) principle after the scanning process. Upon further reading, 5 papers were shortlisted and summary of the contributions of the shortlisted articles are summarized in the below table, which highlights the key factors investigated, findings of the article and research gaps.

The sole purpose of searching through the databases was to critically go through the available research material and to cover maximum possible available material. Therefore, Web of Science and Scopus were selected for literature search as they include the global major journals and conference proceedings especially in Agricultural sciences and food systems.

During the literature search, defined keywords were combined through Boolean connectors to obtain different search strings to be searched in the title, keywords and abstract. Focus was to identify key elements of the onion value chain and research associated with it.

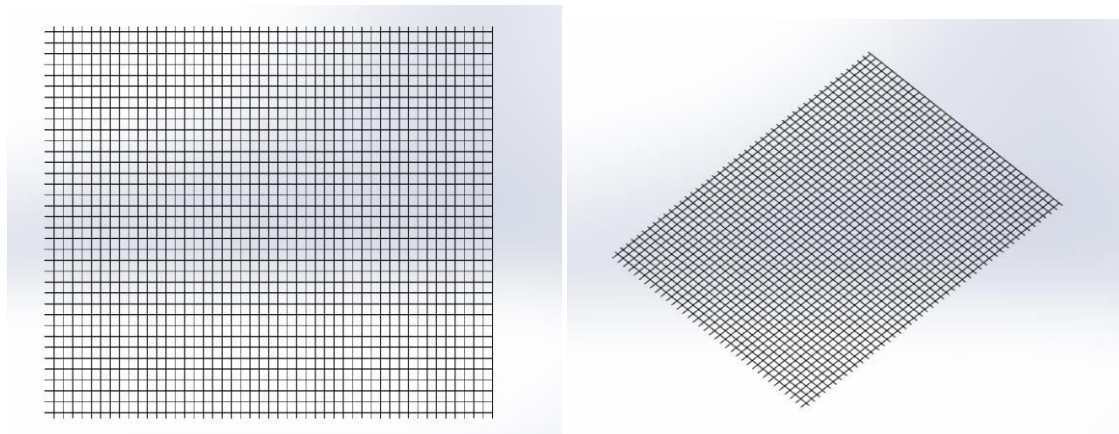
### 3. METHODOLOGY

**Wire mesh:** Welded wire mesh is a type of metal wire screen that is typically created by joining two low carbon steel or stainless-steel wires at right angles and welding them together where they intersect. Typical examples are the reinforcement meshes used in concrete parts. Aside from that, there are industrial meshes in light or heavy designs that can be utilized as barriers, walls, and gratings for safety.

Three-dimensional welded wire meshes are used in a variety of applications, including trays for home appliances, ventilation grids, cable guides, and animal cages. They are also utilized as shopping carts, baskets, and displays for items in supermarkets. Another illustration would be the increasingly common electro-welded gabions used in landscaping, which are designed to hold large amounts of stone together.

High stability and rigidity are two qualities that welded wire mesh exhibits. It can also be welded into frame designs.

**Construction & Testing:** The wire mesh grid is 4ft in length as well as 4ft in width. The grid spacing is 1inch by 1inch respectively. The grid ends are fixed to the Mild steel tubes of the stacking system. The middle portion of the grid tubes are spot welded to each other so there will be no plastic deformation after load is applied. The load applied is 1 Ton i.e. 1000 kilograms.



**Fig 3.1:** Top View & Isometric view of wire mesh grid (4ftx4ft).

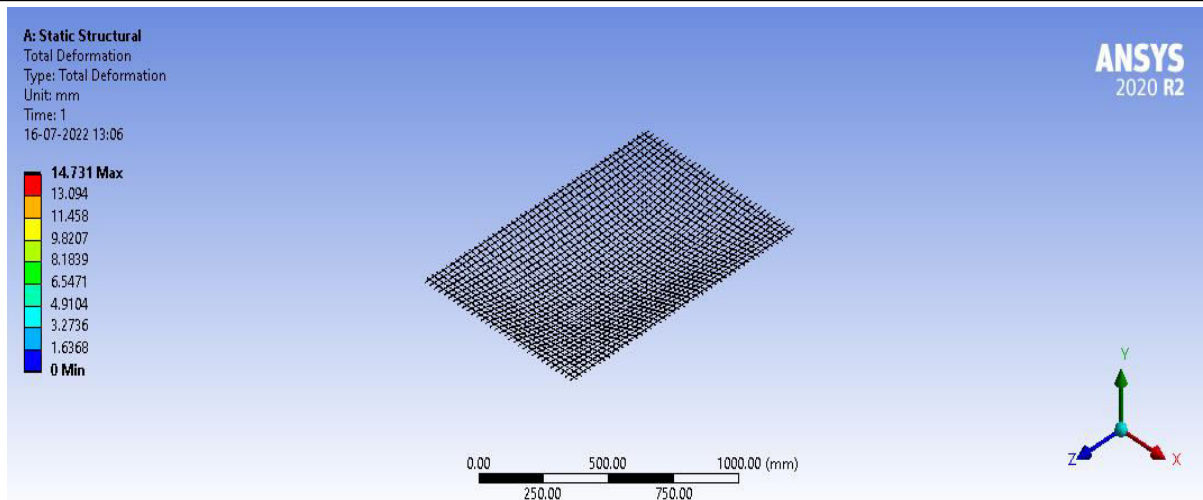
The wire mesh grid used at the bottom of the grid has a wire diameter of 1mm whole & the sides of the bin have wire diameter of 1mm. The reason for this is, the bottom of the bin will be loaded by 1000k Kilograms. In order to carry the massive amount of load the diameter pf wire has been increased.

The capacity of single bin is 1000 Kilograms. The dimensions of the bin are 4 feet by 4 feet. The height of the bin will be 4ft. In order to reduce the space , two more bins will be added to the single bin i.e., creating 3 storey bin as a single unit with a total height of 12 feet. There willl be total 84 single units of bins, that is 28 three storey units will be placed inside the cold room.

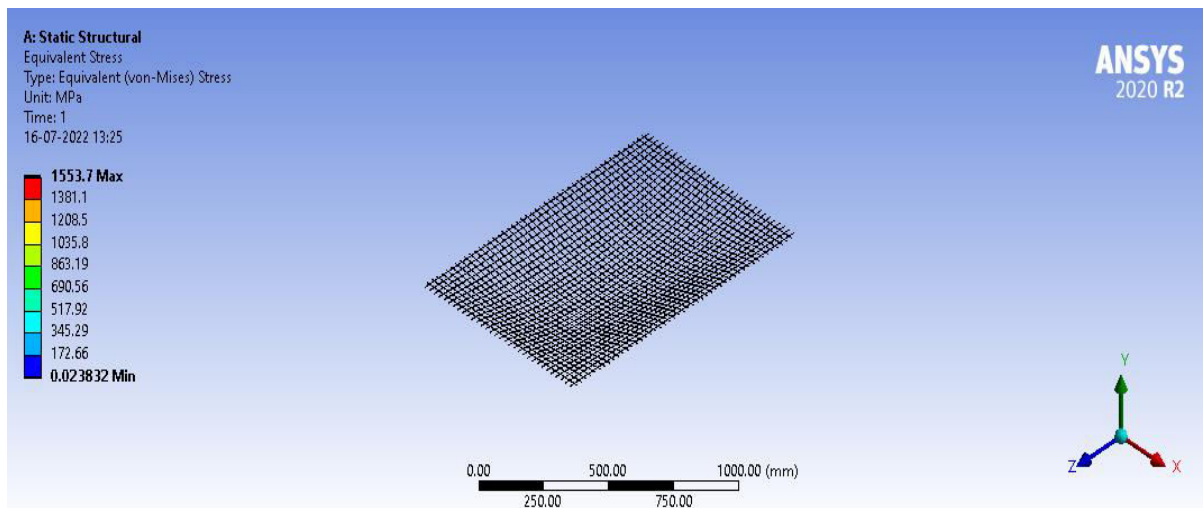
The bins at the bottom will be bolted to two C-sections in order to provide rigid support. The two bins at the top will be bolted on two sides and other two sides will be welded by spot- welding process.



**Fig 3.2:** Stacking system Manufactured model for 1MT

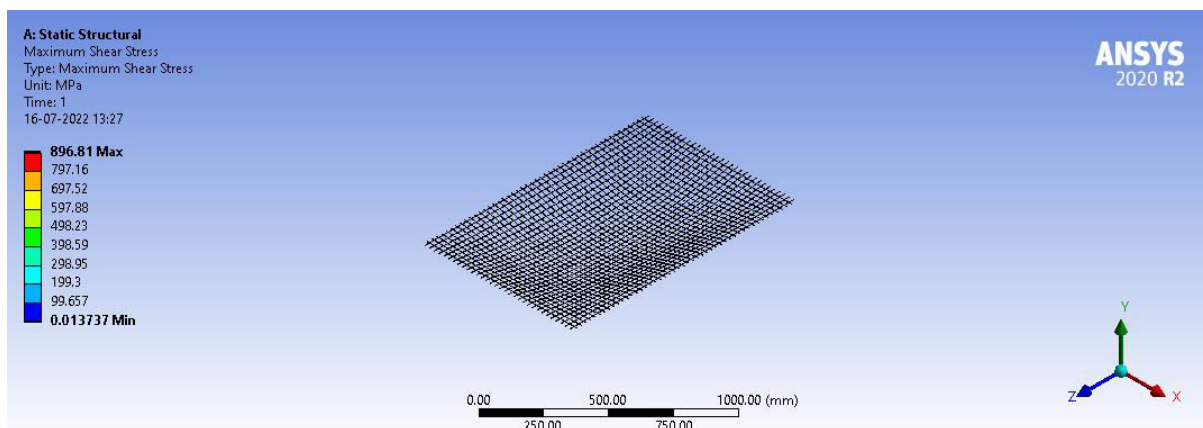


**Fig. 3.3:** Total Deformation for wire mesh grid.



**Fig. 3.4:** Equivalent stress for wire mesh grid.

The Von-Mises yield criterion is used to identify yielding when we check the failure using the Von-Mises Stress. Computing the Safety Factor against failure is best done using the Von Mises Stress Theory. Thus, it is necessary to determine whether the content satisfies the Von-Mises Criteria. The most extensively used and preferred failure hypothesis for steel bridges & wire grid is the Von Mises criterion. It is verified that the von Mises stresses are well inside the elastic yield limit.



**Fig 3.5:** Maximum Shear stress for wire mesh grid.

Prior to Von-Mises' discovery, it was clear that the failure was caused by shear rather than torsion when examining the tensile test of ductile materials. The safety factor against failure can be calculated using either the Von Mises Stress Theory or the Maximum Shear Stress Theory. Von-Mises' stress is a little more cautious than the peak shear stress theory, nevertheless.



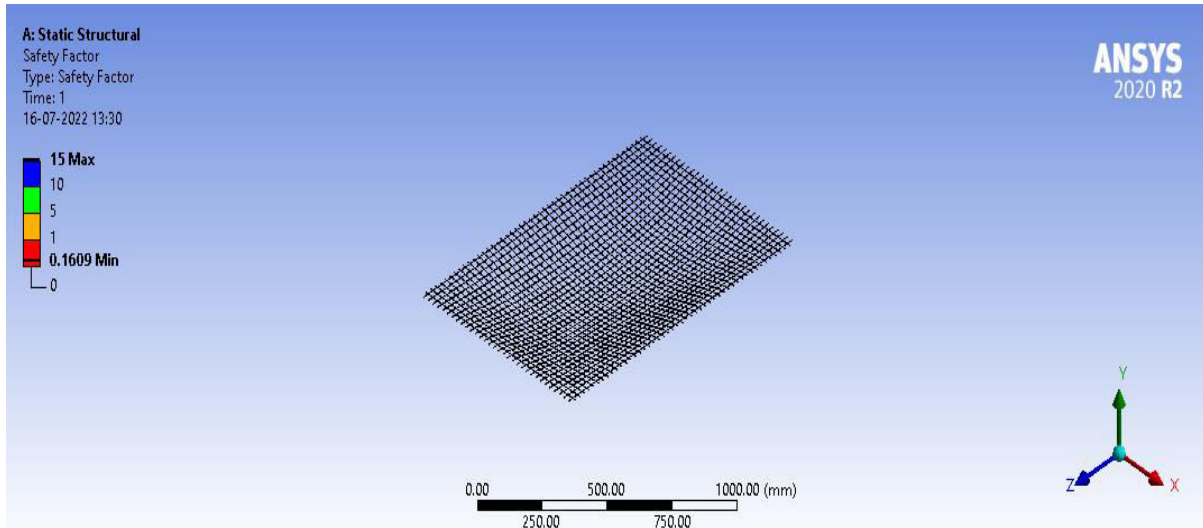


Fig. 3.6: Factor of Safety Plot.

The main purpose of the Factor of Safety is to guarantee that no unforeseen failures, deformations, or defects will arise during the structural design process. The likelihood of the design failing increased with decreasing Factor of Safety, resulting in an unprofitable and unusable design. The above figure shows a factor of safety 5, which means it is safe to carry a load of 1 Ton.

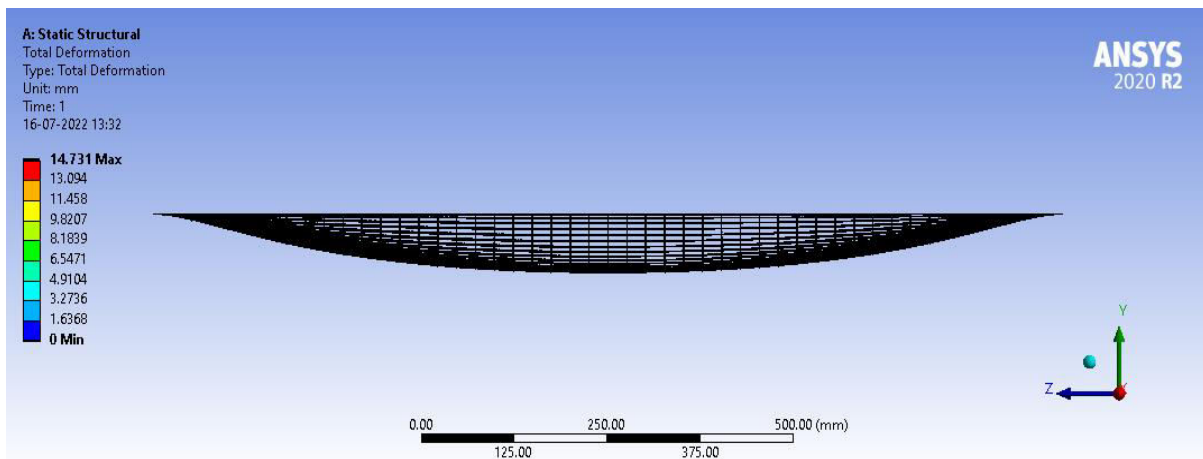


Fig. 3.7: Total Deformation (Front view) for wire mesh grid.



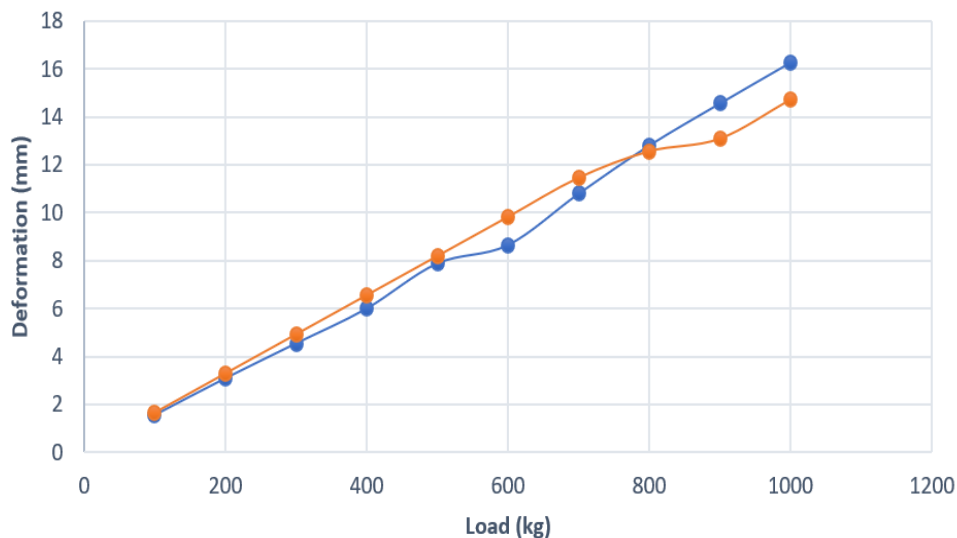
Fig. 3.8: Stacking system with IMT onions (Total Deformation).

**Validation:** The validation of the experiment was carried out using UTM as well as onions were loaded on the bin to check the deformation. The Total deformation was coming out to be 14.731 mm for 1 Ton load analytically whereas the total deformation while loading the onions on the bin experimentally was found out to be 16.2754 mm.

Analytical		Experimental	
Load (Kg)	Deformation (mm)	Load (Kg)	Deformation (mm)
100	1.6368	100	1.5378
200	3.2736	200	3.0745
300	4.9104	300	4.5328
400	6.5471	400	5.9894
500	8.1839	500	7.8768
600	9.8207	600	8.6457
700	11.458	700	10.7896
800	12.5674	800	12.8056
900	13.094	900	14.5643
1000	14.731	1000	16.2754

**Table:** Analytical Readings & Experimental Readings.

### Load vs Deformation (Experimental & Analytical)



**Fig. 3.9:** Experimental vs analytical plot for Wire Mesh Grid (1 Ton).

#### 4. CONCLUSION

Spot welded Mild Steel wire mesh is widely used as bin walls in stacking system for onion warehouses. This analysis computed the strength of the bottom of the bin for bending and shear stresses and checked it for the failure due to Von Mises stresses. It was found that the current dimensions and shape of the spot-welded wire mesh is safe under the given loads.

#### FUTURE SCOPE

Work can be taken forward to optimise the dimensions of the spot-welded wire mesh for maximum load carrying capacity with minimum weight.

#### ACKNOWLEDGEMENT

The above analysis is done on the models being developed at CTARA, IIT BOMBAY and IIT BOMBAY holds all the intellectual property rights related to it. The paper is for academic use and any use outside academics need permission from competent authority.

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**COVID ERA IMPACT ON IT AND AGRICULTURE SECTOR IN INDIA**

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**ABSTRACT**

*Information Technology (IT) has made its presence felt in every field over the past few decades, in fact it has now become the biggest contributor to Indian GDP after service and agriculture sector. It influences every sector from the highest strata of value chain to lowest one in the value chain. Outbreak of Covid in the late 2019 acted as a catalyst in the sense that it made every one realize how important IT can be in such difficult times when people are supposed to be holed up in their homes. The changes which the education sector saw are nothing short of a revolution. Covid changed the way classes and exams were held. IT companies which were planning to give Work from Home (WFH), a try before Covid times had to implement it after Covid and the results were so encouraging that many companies are now planning to extend it indefinitely. Covid also impacted many sectors adversely. In this paper we have tried to study the impact of Covid on IT and Agriculture sectors specifically.*

*Keywords: Covid, Information Technology, Agriculture, Impact*

**INTRODUCTION**

Covid-19 has caused a lot of disruption. It has had a significant impact on people all over the world. This has had a broad reaching and varied effects across industries [1]. We were all caught off guard by the corona virus's quick global spread and the severe illness caused by it, known as Covid-19. Additionally, this pandemic has caused significant social upheavals, disrupted almost every industry, and had an effect on everyone's life and livelihood in almost every nation. The majority of travel, in-person meetings, and conventions have been outlawed, businesses and educational institutions are closed, many workers are required to work from home, supply chains have been disrupted, and people are being forced to isolate themselves. The resulting economic, commercial, and social effects could last for months, and they will be felt for years [2]. Millions of workers were forced to work remotely due to the dramatic change in the workplace brought on by the pandemic caused by the novel Corona virus. It significantly affected both family and work culture. The "New Normal" of life became remote work, physical separation, online education, and virtual meetings. Work from home is nothing new for many multinational corporations, and they actively promote it in order to boost productivity and reduce costs [3]. However, there is an urgent need to consistently engage, monitor, and promote a culture of inclusive, collaborative growth for employees, supported by a strong digital infrastructure to allow for work from anywhere.

In India, which has the second-largest population in the world, Covid-19 disease is a serious problem. India began looking into 1 lakhs Covid-19 infection cases on May 18th, and as of July 11th, there were 8 lakhs total cases. In India, social exclusion and lockdown regulations were used, but they also had an effect on the economy, standard of living, and environment. Where there was a negative effect on the economy and human life, there was a positive effect on the environment [4].

**Impact on IT Sector**

As Covid-19 negatively and deeply affected various sectors of Indian economy whether that is aviation, hospitality, cyber security, education, manufacturing or other sectors. Figure1 shows the different aspects of IT Industry which were impacted by Covid 19.

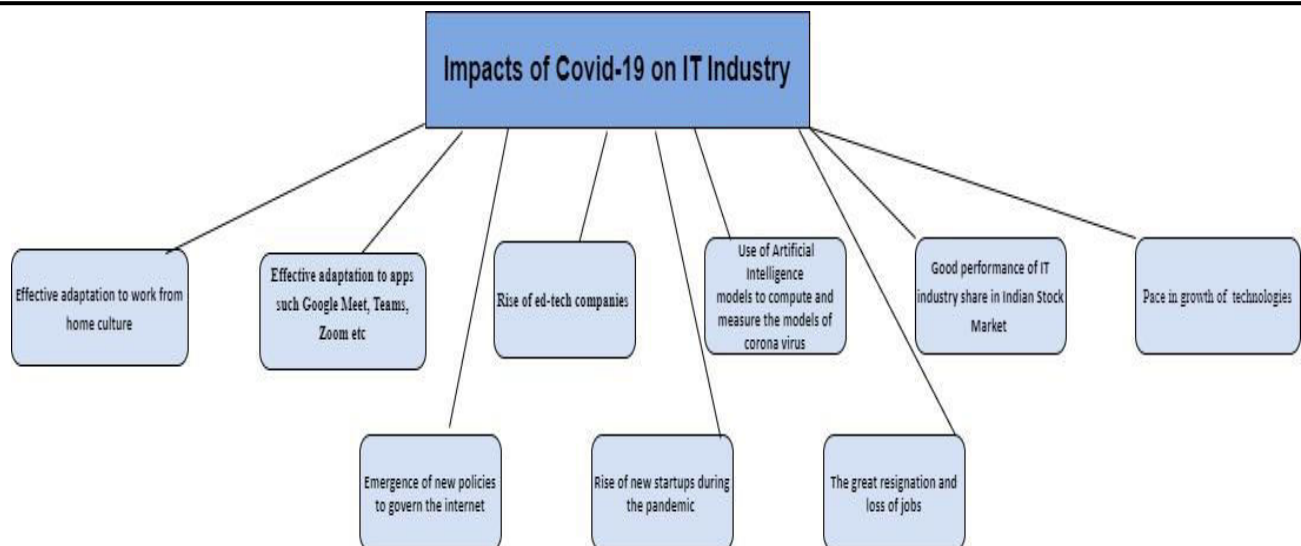


Figure 1: Impact on IT Sector

**Impact 1: Effective Adaptation to (WFH) Culture**

Since the beginning of this pandemic, the IT professionals are working from their homes and are effectively doing their jobs. Initially it was tiresome and lethargic to sit in a room and do the work alone, but with time everyone adapted to this methodology and is now effectively doing the work. Till date, most of the big tech giants are making their employees work from homes; this is beneficial for the company also, as they are cutting their expenses when the employee is working from home [5].

**Impact 2: Effective Adaptation to Apps Such Google Meet, Teams, and Zoom**

People of this country have effectively adapted to social media meeting platforms such Google meet, Microsoft teams, zoom meeting for their meeting purpose or for their online education classes. These platforms are easy to use and quite effective in their means of work so they became a top pick by Indian audience for their everyday work. According to Statista, Zoom app was so popular during the pandemic that in the quarter 1 of 2020 its download counted 17 million while in quarter 2 it rose to 67.3 million, for quarter 3 = 35.6 million, quarter 4=18.9 million, for the first quarter of 2021 = 13.8 million, and for quarter 2 of 2021 witnessed download of 28.4 million for the application. Zoom rapidly increased its revenue over the past two years, growing by 319% in 2020 and 53% in 2021 [6].

**Impact 3: Rise of Education (Ed-Tech) Companies**

Ed-tech companies such Byju's, Vedantu, Great learning, etc boomed their business during the pandemic. Since most the children were studying from their houses that came as an opportunity for these companies. Their sales rose exponentially during this period and so did their profits. The popularity of Byjus's can be understood by the fact that it became the world's largest education technology company and crossed an evaluation of \$10.5 billion and it also acquired offline retail chain of coaching Aakash [7].

**Impact 4: Use of Artificial Intelligence Models of Corona Virus**

Artificial intelligence has become very important in the field of science and technology and now in the medical sector. With the help of AI we were able to identify and analyze the behavior of corona virus and study its properties such as how it reacts and how it spreads etc. All of these things were done with various machine learning models and they were quite effective to do the computation and gave the expected results. Even the model to predict the peak of second Covid wave in India was also done through the help of data science and machine learning by the researchers of IIT Kharagpur [8].

**Impact 5: Performance of IT Share in Indian Stock Market**

Various IT industry companies such as TCS, WIPRO, etc did well on the Indian Stock Exchange during the pandemic time. Their share prices went high in this time period and people were keenly buying these stocks. Even the Initial Public Offering (IPO) of Latent View saw a massive subscription of 339X and became the most subscribed IPO in the history of Indian stock market [9].

**Impact 6: Pace in Growth of Technologies**

This pandemic made people more familiar with technologies such as 5G, virtual and augmented reality, block chain, distributed cloud, hyper automation, artificial intelligence and machine learning. So, these technologies boomed at a pace never seen before and till now there is no stopping to it [10].

**Impact 7: Emergence of New Policies for Internet**

Last year there was disagreement between the Government of India and Whatsapp regarding the policies issued by the Whatsapp. Indian government came up with its own set of rules and regulations which Whatsapp has to follow if they wanted to continue operating in India. For sure there is a need of new internet policies to govern its operation and functionality as the number of users are increasing exponentially and the old existing policies are just too old for the present era [11].

**Impact 8: Rise of New Startups during the Pandemic**

This pandemic also witnessed rise in startups related to IT sector. Various startups were helping the rural communities in India with innovative business tactics and thoughtful collaboration, which were power driven by various technologies. Many startups even became Unicorn crossing an evaluation of over \$1 billion. Over the past six years, startups have dramatically increased in India. From only 733 in 2016–17, the number of newly recognized startups has increased to over 14,000 in 2021–22 [12].

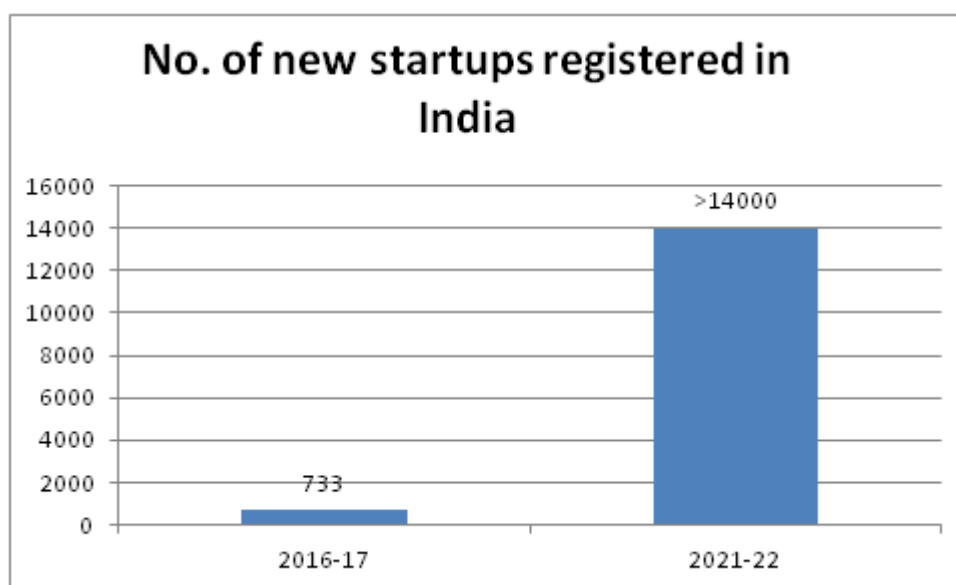


Figure 2: Startup in India

**Impact 9: The Resignation and Loss of Jobs**

It was not that IT industry boomed only during this pandemic, it also suffered a lot. Studies show that during the first wave in India, nearly around 150000 to 200000 people lost their jobs in the IT sector [13]. This number was expected to increase more during this pandemic. In US, a phenomenon named The Great Resignation occurred during which in November, 2021 alone 4.5 million people left their jobs and in total 75.5 million resigned in the total last year. Furthermore, according to a study conducted by Resumebuilder.com poll, nearly 23% of the workforce will seek new jobs in 2022. And due to this great resignation, the IT and Tech. industry hired people at an unprecedented rate, the top five companies hired around 1.7lakh people in 2021. And it was also found that people are now seeking job opportunities in sectors where they do not have any experience [14].

**Impact on Agriculture Sector**

The agricultural sector had run smoothly throughout the lockdown. The Indian government has taken all essential steps to ensure that agriculture-related operations run smoothly. Agriculture and related pursuits were protected from the lockdown. The opening of stores selling seeds, pesticides, fertiliser, and other input-related goods and services was permitted to supply farmers with inputs. Movement of agricultural equipment, in particular combine harvesters, was made easier within and among states. Following are the some impacts that followed after pandemic:

**Impact 1: Economic Growth of Agriculture**

Agriculture grows at 3.9 per cent in 2021-22 and 3.6 per cent in 2020-21 showing resilience in the face of COVID-19 [15].

**Impact 2: On Production**

At the All-India level, the impact of COVID-19 negatively impacted agriculture production in nearly half (47%) of sample districts. Magnitude-wise, agriculture production (-2.7%) had not been significantly impacted, largely because wheat and other Rabi crops were almost completely harvested by the end of April 2020. However,

production in the allied sector had sharply decreased, particularly in the poultry sector (-19.5%), followed by the fisheries sector (-13.6%), mainly due to a sharp decline in demand for these products, which may have been caused by the widespread anxiety that had been circulating in the wake of COVID 19 regarding the safety of non-vegetarian food, particularly poultry meat, for reasons related to health. Similarly production in the dairy (-6.6%) and horticulture (-5.7%) sub-sectors also decreased, these decreases were caused by decreased demand for these products and disruption in their supply chain [16].

### Impact 3: Availability of Agriculture Inputs

The availability of agriculture inputs, such as seeds (-9.2%), fertilisers (-11.2%), pesticides (-9.8%), fodder (-10.8%), etc., decreased by 9 to 11% as a result of restrictions placed on the movement of people and materials and the closing of stores. 58 percent of the sample districts in India as a whole experienced poor input availability [17].

### Impact 4: Prices of Agriculture Inputs

Prices of Agriculture inputs such as seeds (8.8%), fertilisers (10.0%), pesticides (9.0%), and fodder (11.6%) increased in the range of 9 to 12% due to supply chain disruption caused by restrictions on vehicle movement and closure of stores and markets. At the national level, 54% of the sample districts saw an increase in the cost of agricultural inputs, possibly as a result of their scarcity [18].

### Impact 5: Agriculture Marketing

Even though local procurement centres were established by various State Governments under their control, restrictions on vehicle movement negatively affected the smooth operation of agriculture marketing through mandis in about 74% of sample districts. More districts in the sample were negatively impacted than favourably, accounting for 87% of the impact on the operation of rural haats. This was primarily because local government officials in the majority of the nation's districts outrightly prohibited the opening of rural haats [19].

### Impact 6: Migrating Workers

In India, there were about 40- 50 million seasonal migrant workers. Images of hundreds of thousands of migrant workers from various states walking more than 1000 kilometres to get back to their villages have been featured in global media [20].

## CONCLUSION

It is quite clear that Covid has opened up the doors for the emergence of new technologies. Artificial Intelligence is going to play a very important role going forward and it has already changed many of the existing businesses. Many industries which used to be dependent on human resources are now operating without them using AI. Education sector is one which has seen a complete revolution. Many Education based companies have propped up after Covid, those who were already operating have intensified their operations. The need for handheld gadgets has increased with people using them more often than ever before for their financial transactions, online purchasing, meetings, attending classes etc. Since a lot of restrictions were placed on movement of people during Covid period agriculture sector, which is human labour intensive got negatively impacted. Migrating workers and thus their shortage negatively impacted the agricultural production. All the phases of agriculture starting from sowing seed to reaping of crop witnessed shortage of workers thus impacting agricultural sector as a whole.

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## COVID ERA PERSPECTIVE OF CYBER ISSUES IN INDIA

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**ABSTRACT**

*Since January 27<sup>th</sup> 2020, when first official case of Covid-19 was reported in India, the number of Covid-19 cases increased rapidly at an exponential rate. Till date, nearly 4 crore cases have been reported in India with over 4.9 lakhs official deaths. The country has witnessed nearly 3 waves of this pandemic and is still fighting to recover from this outbreak. The outbreak deeply affected various sections of the society like business owners, industry working people, school going students, education sector etc. Covid-19 pandemic is surely one of the most devastating outbreaks that humans have faced in the 21<sup>st</sup> century and still there is no exact day or month to which we can say that it will finally end. Death figures due to this pandemic in the whole world looks really humongous, approximately 56 lakh deaths have been reported till date. Cyber Security is one of the adversely affected sectors by the sudden outbreak of Covid-19 around the world and India is no exception. This paper focuses on major impacts of Covid-19 on Cyber Issues.*

*Keywords: Cyber security, Covid-19, Cyber attack, Perspective*

**INTRODUCTION**

Covid-19 pandemic has caused unprecedented changes in every industrial sector whether it is Automobile, Hospitality, Aviation, Retail, or any other. All in all, majority of these sectors have experienced negative impacts only due to this pandemic and lockdown. Cloud networks, and data centers have proved to be very important assets in this era of coronavirus where people get the ease of doing work from their homes. With the increasing use of internet and cloud services in Covid era the cases of cyber-attacks reported an increase in their number. According to Kaspersky “In February 2021, nearly one year from the start of the pandemic, there were 377.5 million brute-force attacks, a far cry from the 93.1 million witnessed at the beginning of 2020. India alone witnessed 9.04 million attacks in February 2021. The total number of attacks recorded in India during Jan & Feb 2021 was around 15 million”. [1] Technologies such as Chatbots, Virtual Private Network, Firewall, etc have become a part of day to day life now. IT Industry cannot grow to its fullest, if cyber security is compromised, so great concern should be put into it. This culture of work from home gives a call for great focus on cyber security, as being online means more and more chances of getting attacked. Indeed there were some sectors that were not that badly affected by this pandemic, one such industry is “IT Industry”. Initially, the IT Industry also suffered a bit in the first few months of the pandemic but tackled this problem not only quite well but also emerged as one of the prominent players who profited due to this pandemic. The onset of the pandemic was really very hard for the IT Industry. All the offices were to be closed down and it was hard for all the industry personnel to adapt to the work-from-home culture. The people were never used to such a kind of work culture, so they were afraid to step into these new shoes. In the beginning, this culture was more and more lethargic and sort of depressive. But sooner, people got used to it and the culture of working in the IT Industry changed drastically. Most industries are still struggling to recover from this pandemic, as per IBEF, the export revenue of the IT industry is estimated to be US\$ 150 billion for the financial year 2021. According to Gartner estimates, IT spending in India is estimated to reach US \$93 billion in 2021 (7.3% Year-on-Year growth) and further increase to US \$98.5 billion in 2022 [2]. These massive figures clearly show how important IT industry is for the growth of India's GDP. “National Association of Software and Service Companies (NASSCOM) said that there has been a significant acceleration in technology spending during the pandemic and witnessed a 30% jump in digital transformation deals” [3]. Baz, M. et.al shows in his articles that despite the fact that the Covid-19 pandemic has brought the world to a complete standstill, people have been able to maintain their digital interactions thanks to information technology. Businesses, industries, and workers around the world are now connected to each other and to the data of the organisations thanks to cloud networks, departmental servers, data centers, and digital devices. The demands placed on digital frames have quickly increased in this situation. While this has helped in the fight against the spread of the coronavirus, the alarming rise in the number of cyber attacks has turned out to be a major problem today. Cybersecurity needs to be improved in order to safeguard user data and rein in the growing cybercrime problem in order to avoid the emergence of a second crisis [4]. According to Yadav et.al, almost every aspect of society was affected by the Covid-19 pandemic in 2020, the global economy was severely impacted as a result most of the economic sectors suffered a loss. When that happened globally, technology was extremely important in keeping people connected. Employers began using online learning in educational institutions. From home, there has also been a significant demand for various businesses like online healthcare, food, and grocery delivery purchasing, etc. Despite the many ways that

technology has benefited us, we also noticed a sharp rise in cyber attacks worldwide [5]. Dwivedi et al shows the Covid-19 pandemic has compelled many organisations to undergo significant change, rethinking key components of their business processes and use of technology to maintain operations while adhering to a changing landscape of guidelines and new procedures [6]. The majority of educational institutions now use online platforms, and both students and employees are able to work remotely. Additionally, there is a huge demand for these businesses, e-healthcare services, food deliveries, and online grocery shopping. Attackers with bad intentions have seen Covid-19 as a chance to carry out attacks for monetary gain and to advance their nefarious goals. Ransomware and other tools are being used to attack healthcare systems. Through Covid-19-related content, people are becoming victims of phishing scams [7].

### Perspective of Cyber Issues

Covid-19 has been around now for more than two years and whole medical fraternity as well as government is trying their level best to tackle this pandemic with their full strength. However, even medical sector faced cyber attacks even during these hard times. In our country too, pharma biggies such as Dr Reddy's laboratories and Lupin reported various incidents of breach in cyber security. Their database was made publically available online for millions of users' worldwide [8]. Some of the impacts of Covid-19 on Cyber security are listed below.

#### Perspective 1: Unprecedented Rise in Number of Ransomware Attacks

Ransomware attacks increased a lot during this pandemic and some ransomware lure included critical information of vaccines, some sort of financial scams in name of government official, free downloads of various software, etc. According to Check Point Research, a firm that provides cyber threat intelligence, there was a 45% increase in the cyber attacks faced by healthcare organizations around the world and 37% in India between November and December of the year 2021. Most cases in India were reported of ransomware [9].

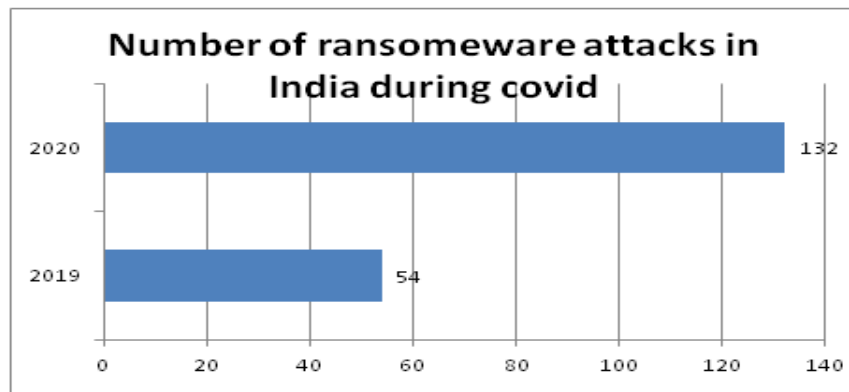


Figure 1: Ransomware attack during Covid-19

#### Perspective 2: More and More Use of Virtual Private Network

Since, the beginning of this pandemic the culture of work from home started and everyone had to do their work from their own safe houses. People no longer used their company's virtual private network (VPN) servers, so they had to find a secure solution to keep their data safe and secure. So, there was massive download of VPN. Global VPN provider Atlas VPN's analysis showed that in the first half of 2021, VPN installs in India touched 348.7 million representing a growth of 671% over 2020. India is now at 4<sup>th</sup> place after Qatar, UAE and Singapore [10].

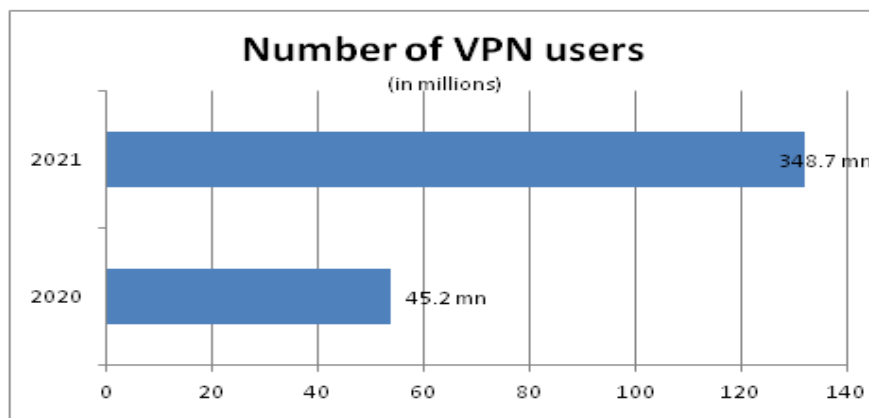


Figure 2: Number of Virtual Private Network



**Perspective 3: Delay in Detection of Cyber Attack and Response to It**

During the period of Covid-19 the number of cyber attacks increased rapidly and so their detection was a tough task for the security team of any organization. It was more difficult to respond to those threats on time as the number of attacks increase drastically. Therefore security defense should be checked time to time and a dedicated team should be made for it that continuously sense for an attack and can quickly respond to it [11].

**Perspective 4: Security Breach Due to Public Internet Hotspots**

Since, more and more people are starting being online to do their work so there is a high demand for free and fast internet. And for free and fast internet many times people try to use public hotspots, without knowing the fact that these hotspots can be the potential spots of getting attacked. So organizations should tell their employees to limit using public internet facilities especially when the data they are working upon is of high importance because there are high chances of it getting breached [12].

**Perspective 5: Influx of Cybercriminals**

As due to loss in company revenue due to this pandemic and lockdown, companies were forced to expel their employees to cut down the cost and so lakhs of these skilled personnel were left with no jobs. Some section of this highly skilled force went down to the path of hacking and doing cyber frauds to earn some money. A high increase in the number of hackers was witnessed during this pandemic [13][14]. From figure 3 below it is clear that there has been a significant increase in the number of cyber crimes in India post Covid 19.

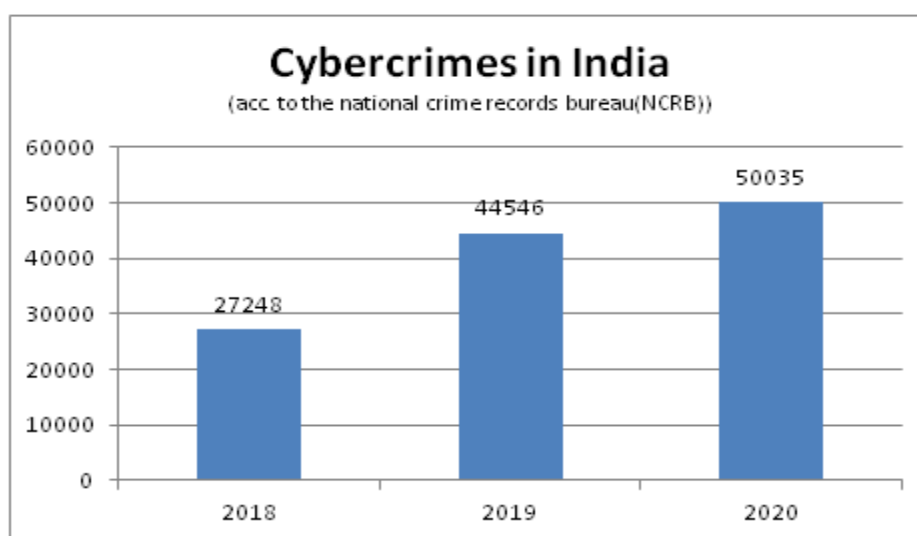


Figure 3: Cyber Crimes in India

**Perspective 6: Post Covid-19 Cyber Security Recovery Plan**

Some analysts are predicting of a recession as one of the impacts of the pandemic. There is no doubt on the fact that Covid-19 has put a massive strain in the world's global economy and still we need ample amount of time to recover from this loss. Many organizations started downsizing their work force. Cutting operations such as cyber security were also witnessed since it was thought of to be non critical. But now, organizations have understood the importance of cyber security and are investing more and more in this field. Many organizations have now changed their business continuity plan and remote working policies are giving more emphasis on cyber security for post pandemic times. New policies for cyber security and also legal framework and legislation have been made both from the end of government and also from the end of Industry experts so that loss due to cyber attacks cannot occur in the near future [15].

**Perspective 7: New Meaning for Normal**

A survey of existing cyber security personnel showed that the new normal habits of trouble shooting computer, installing a Virtual Private Network (VPN) and manning helpdesks was quite common now, which was very unusual in the era of pre pandemic. Also it was clearly sensed that number of cyber attacks increased as personnel started working from their homes or from any other remote location [11].

**Perspective 8: More Cases of Cyber Attacks**

The types of cyber attacks that one has faced during pandemic were new and the sudden spike in the number of attacks was worrisome for the people. While working from home we were safe from the corona virus but what we were not safe from was the virtual viruses or the cyber attacks. Cyber security professionals are trying their level best to cope up with the security of the various organizations and provide them with optimal solutions [16].



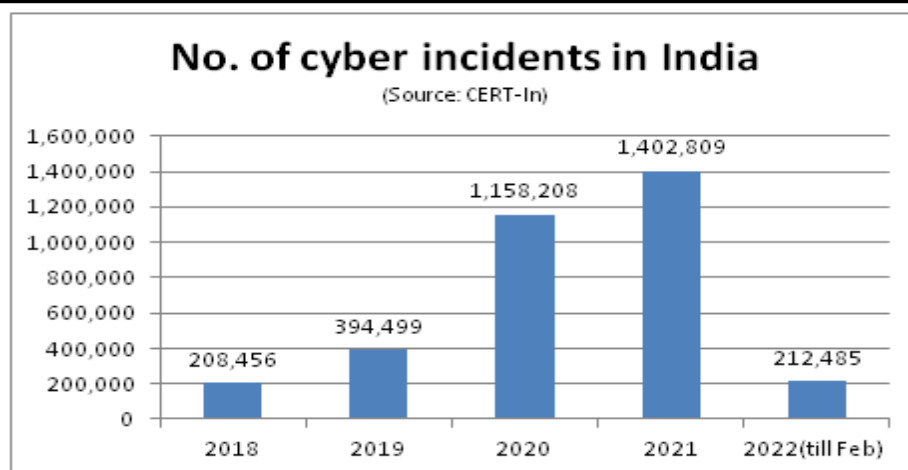


Figure 1: Cyber Incident in India

**Perspective 9: Providing Security to New Businesses Coming Up Online**

With the advent of the virus, businesses were not able to grow revenue in offline, for example customer now preferred to give money in form of online transactions rather in cash mode or customer wants to order online and get it delivered right to its doorstep. Thus a huge number of small businesses or startups started functioning in online manner whether it was taking orders online or doing payments online. Digital presence made the reach of business increase at a massive scale. Use of VPNs was a major part of securing the data of a business [11].

**Perspective 10: Extra Precautions for Certain Sectors**

Health sector played the most important role in handling this pandemic. Everyone wants to consult the doctor for any health issue and get guidance accordingly. Only few hospitals had the infrastructure pre Covid times to provide their facilities online or being internet driven. Getting more hospitals provide online assistance increases the risk of cyber attack. Additionally, the banking system is also particularly impacted, as they are still relying on older or physical techniques for much of their work, e.g. employees doing their work from the respective branches [17].

**Perspective 11: Get Industry Ready with the New Trends in Technology**

Despite these hard times, Covid-19 has emerged as the best time for cyber security sector to evolve and revolutionize the way of working. The trend of working from home has depicted that networking is critical for remote working businesses. And also that software defined networking is both reliable and cost effective. For being a cyber security expert one should be trained in network configuration. Secondly, cyber security experts will now be working from remote locations to collaborate, solve problem, and perform remedies such as testing, deployment of innovative thinking, conducting threat analysis. Third, cyber professionals should be willing to learn and adapt to ever changing demands of the industry, they must be willing to learn and cope up with the latest trend in sector [18].

**CONCLUSION**

The pandemic has provided opportunity for both the cyber security and IT industry to grow enormously, adapt to the current situations and keep innovating new things to fulfill the upcoming demands. This is time the best time for these industries to attract new talents to come, learn and innovate something new. This is also very good opportunity for the fresher engineers for getting hired in the industry. So that in the near future we get trained cyber security experts to cope up with the challenges. New cyber security policies need to be drafted considering the tremendous increase in the number of people using internet, companies also need to invest more towards this sector to protect the privacy of their data. As we all adjust to these new normal, organizations and industries will be forced to optimize costs and accelerate their digital transformations and this whole process should be backed up by the Government of India. Both the industry experts and government officials should sit together and frame new rules and regulations for the proper functioning of the internet. Only those players who could cope up with this new normal and can act accordingly will survive in this game.

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## PEDAGOGICAL PRACTICES AND LABORATORY FACILITIES IN SCIENCE EDUCATION: AN OVERVIEW

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### ABSTRACT

*Education is the backbone of any nation. The quality of nation depends on the quality of its citizens. The quality of citizens depends on the quality of their education. The quality of their education depends on the quality of teachers. The shape of the contemporary world is being determined to an ever increasing extent by science and technology and it impacts directly and indirectly on men and things. It is profound on people in many lands including our own having contributed to the advancement of the fundamental science and its continued process. One should make more effective use of laboratories for acquiring Practical knowledge. The capital investment on buildings and equipments impacts the science student. The practical works and laboratories reminds us about the dominating characteristics of the modern world. Primarily it promotes and develops the openness of mind, tolerance, world wide co-operation, ability to adjust to change and above all encourages a vigorous and relentless pursuit of truth and free enquiry. The vital role of science in India is to fight on ignorance, poverty and disease and functions a powerful instrument to bring about social transformation, so that millions could live longer and happier lives. The present study throws an insight on various schemes like collaborative learning, science laboratory facilities, and activity-based learning aspects of higher secondary education in India.*

**Keywords:** Science Education, Heuristic method, Experimental learning, Classroom practice, Laboratory facilities.

### INTRODUCTION

*“Science Education will be strengthened so as to develop the child’s well defined abilities and value such as the spirit of enquiry, creativity, objectivity, the courage to question and an aesthetics sensibility”.*

- National Policy on Education (1986)

Education at all levels is to promote in the young generation a sense of purposefulness and mission, dedication, self confidence and faith in the country’s future. We have to find and provide our youth with adequate and inspiring opportunities of participating in national reconstruction and in the achievement of national goals. Science is an accumulated and systematized learning in general usage restricted to natural phenomenon. The progress of science is marked not only by an accumulation of fact but by the emergence of scientific method and after scientific attitude. Three basic principles of nature of science can be identified as an accumulation and systematized body of knowledge, The scientific method of inquiry, The scientific attitude.

Science is both product or a body of knowledge that has been accumulated by scientists and the process in which they acquire this knowledge.

The body of scientific knowledge can be classified into facts, concepts, generalizations, theories and laws. The dimension of science is the process by which knowledge is acquired. In an attempt to define processes of science, the American Association Advancement of Science (AAAS) asked scientists to say what they actually do the following list come from this inquiry.

Observation, Classification, Number relations, Measurement, Space / time relation Communication, Prediction, Inference, Making operational definitions, Formulation of hypothesis, Interpreting data, Identifying and controlling variable, Experimenting.

### Pedagogy of Teaching

#### 1. Heuristic Method

Science is not a thing to be talked about but a practical subject and the correct way to learn is by doing. The method of teaching ensures the use and development of sense of touch, sight and hearing. This aspect of science teaching was totally regulated in the early years of science introduction in schools and revolutionised the thinking of science education as the last part of nineteenth century. The basic idea of the method is that the student should discover everything to learn about from his own observation and experiences. Instead of imparting facts the teacher should provide activities in which the students work independently and by this mean get training in scientific method.

In the words of Prof. Armstrong "Heuristic method is the method of teaching which involves our placing the students as far as possible in the attitude of the discoverer". The word 'Heuristic' is derived from the Greek word 'Heurisko' which means to find out of 'Euriskein' means discover. So any method excites children to work and think for themselves which can be called Heuristic method. Any method which is opposed to dogmatic method of teaching in which the observing and reasoning powers are most existed in which the pupils work and think for themselves in which the habits of self activity and self difference are fostered is called 'Heuristic method' of teaching

**Principles of Heuristic Method:**

Principles of freedom, experiences, activity learning by doing, purposefulness, logical thinking, play way, individual work.

**2. Collaborative Learning**

Collaboration involves the mutual engagement of participants in coordinated effort to solve the problem together. Defining collaboration by the non-distribution of labour does not avoid ambiguities some spontaneous division of labour may occur in collaboration. The person who has more to say about the current topics takes the task - doer's while the other become an observer, monitoring the situation. The observer can contribute by criticising and giving topic diversion motions, which are not the primary roles of the nature of the task and may change frequently.

**3. Activity - Centred Learning**

This activity-based learning stress that processes of science learning by doing is the best method. Learning is its basic premise. An example of this learning is the Hessian curriculum which gives completely freedom to teach any topic with the following four criteria namely:

- An experimental approach is to be used.
- Instruction should be based on the problem solving.
- Observation and interpretation of result is a part of the activity.
- Important of facts and principles taught to the students should be relevant to the individual's needs and those of society.

**4. Experimental Learning**

Experimental learning or experience based learning can be regarded as the earliest approach to learning for the human race. In the formal education system it has tended to be developed and regarded as fundamentally inferior to those organized forms of knowledge which have been constructed as subjects or disciplines. The practical and the applied do not tend to have the same status in educational institutions as the academic and the abstract contribution to make in defining how people learn. By asking "what" questions and relentlessly dissecting the answers until a residue can be identified, they attempt to reveal the truth about a phenomenon. Experimental learning was defined as learning which accompanied mental, emotional, and physiological stimuli. These necessary and sufficient conditions for experimental learning were organized and distilled from a range of individual and group responses.

**The Science Laboratory****Planning of Science Laboratory**

To learn Science is to do Science. There is no other way of learning. -Dr. D. S. Kothari

For an effective and efficient teaching in science a good laboratory and necessary equipment is essential. In recent years the purpose of teaching science at the secondary stage have undergone drastic changes. We do not stuff in the minds of the pupils with mere facts of science but developing requires them the application ability, skills of experimentation, construction, improving scientific attitudes, interest, appreciation, etc. These can be achieved only if the students get the opportunities to work with their own hands in an atmosphere which pervades science teaching, planning a science laboratory.

Before constructing the laboratory the following factors should be taken into consideration in the planning stage

- The number of pupils working at a time
- The minimum space necessary for each people for comfortable working

- Limitation of number of science teachers in the secondary schools
- Need for ancillary accommodation storage
- Designing the science classrooms and laboratory in such a way that it could be used for science teaching for middle as well as for the high classes
- Imperative need for economy

## **2. Equipments need in a Effective Science Laboratory The Chemistry laboratory (NCERT)**

The design for the chemistry laboratory as suggested by the NCERT is given here :

- Working table with shelves, cupboards and with acid – proof
- A demonstration table with cupboards and with water and gas fittings
- Projected platform in the walls for balances
- Shelves for keeping the chemical reagents. These may either be fitted on working table or in the walls
- Walls black - board
- Sinks in the walls or in the working tables
- Almirahs
- A fume cupboard

### **The Physics Laboratory**

The Physics laboratory should be equipped with

- Working table of about size of drawers one dimension tables with drawers .
- One dimension table with water and gas fittings.
- A wall black - board behind the demonstration table.
- Sinks in the walls.
- Projected platform in the wall for balances.
- Almirahs.
- Stools of two size.

### **The Biology Laboratory**

It should be equipped with

- Table along the walls having glass- paned windows so that enough light is available for microscope study. These should have drawers and water fittings.
- A demonstration table.
- Stools.
- Sinks.
- Wall black- board.
- Wall shelves for chemicals .
- Almirahs.
- Space for aquarium- vivarium and for keeping other animals.

## **3. Selection of Apparatus and Chemicals**

While making a list of requirements the administration or the teacher should take into consideration the following points

- Finance requirements

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- The number of subject taught
  - The scheme of work and the method of teaching
  - Relative emphasis on demonstration group work and the individual work
  - The level of students
  - The total number of the people in the class
  - The total number of hours devoted to teach science
  - The capacity of the laboratory
  - The environment in which the subject is taught The teachers qualifications, knowledge and ability

### **CONCLUSION**

Learning by doing is one of the cardinal principles of teaching science. Experimentation has put many theories on the sound footing and has also resulted in the rejection of many . The achievement of modern science is mainly due to the applications of the experimental method. It is

, therefore important that practical work should be a prominent feature in any science course and the primary objective in determining a technique of instruction is to provide for a maximum of pupil activity . It provides opportunities for training in scientific method as a result of practical work the pupils or many good habits like co-operation , resourcefulness, initiative, self- dependence, self- reliance etc. which are applicable in the daily life of the pupils.

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**IMPACT OF PERFORMANCE APPRAISAL ON EMPLOYEE PRODUCTIVITY**

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**ABSTRACT**

*In the ever-changing pandemic environment, it becomes challenging for the organization and employees to adapt and keep abreast of everything happening around them. Organizations are finding it very challenging to retain skilled talent as employees are attempting to find greener pastures. The work from home concept has again posed a severe challenge to the employees to prove their worth. Organizations are looking for better and more accurate methods and tools to appraise their employees. Therefore, this paper attempts to understand the significance of employee appraisal and its effect on employees' productivity. It also tries to understand the new methods of performance appraisal followed in many companies today.*

*Keywords: Performance Appraisal, Employee Productivity*

**INTRODUCTION**

Performance appraisal is defined as assessing the employee's job performance according to the benchmarks related to their work, such as technical knowledge, efficiency in completing a task, versatility, teamwork, supervision, leadership, etc.

It also measures the results of the project employees have worked on, the ability of the employees to coordinate with coworkers, willingness to take responsibility, willingness to learn and update knowledge, etc.

Performance appraisals are imperative to the success and growth of companies worldwide. It is an essential part of HR management to evaluate the work done by the employees. They offer input and help to improve their performance and give due credit to employees for their work. It also provides a platform for the employees to voice their complaints and grievances about the job, etc.

Research reveals that a regular appraisal program can profoundly impact employees' satisfaction and motivation levels. It can help the employer to identify areas in the employee's work that requires attention to training and development. In the long run, the company can gather details that can be used during the recruitment and selection.

Performance Appraisal is conducted periodically to evaluate employees' performance against the stated job requirements. Some of the ways how the Performance Appraisal can enhance employee performance are as follows:

- It helps employees to have a clear understanding of their roles and responsibilities
- It allows employees to see a renewed sense of accountability for their performance.
- Employees are motivated toward their individual goals.
- Employees can prepare for their career and professional development through appropriate training and development.

**LITERATURE REVIEW**

Avery (2004) opines that Performance Appraisal Systems were the basis for evaluating the employees during the Industrial Revolution. During this period, supervisors were clear about their employee's goals, which also determined their pay. Mohammed et al. (2014) say Performance Appraisal is an attempt made by the organization to improve knowledge and workplace ethics, which will make the employees work better. Angelo et al. (2006) explained that performance appraisals are officially authorized activities to assess the workers. Lawrence (2014) defines performance appraisal as an activity that identifies the strength and weaknesses of the workers by evaluating them.

**OBJECTIVES OF THE STUDY**

1. To understand the impact of Performance Appraisal on Employee Productivity
2. To examine the latest Performance Appraisal methods followed by Companies for the Employees.

**Benefits of Performance Appraisal on Employees**

Employees tend to perform and give their best when they know their efforts are helping their organization to move forward. Performance Appraisal should be unbiased in its evaluation and improve employee motivation,

engagement, and productivity. Appraising employee performance is duly documented and evaluated to review the overall performance of the employees regularly.

**1. Provides Clarity On the Goals to Achieve**

Employees become engaged and motivated when they see how their performance and goals align with organizational performance.

**2. Increases the Accountability of Employees**

Performance Appraisal provides the employees with an opportunity to review the employees. It allows the employee to assess and pave the way for employee development.

**3. Helps in Increasing Employee Productivity**

Critical areas of employee performance are analyzed during Performance Appraisal. It can help the employees understand their roles and responsibilities. It ensures that employees are made more accountable.

**4. Helps in identifying areas of Training and Development**

Managers can identify discrepancies in employee performance and are in a better position to devise appropriate training and development plans to increase employee productivity.

**5. Helps to Upgrade Organizational Performance**

Companies are better positioned to discuss what is expected from the employees. This gives a clear picture of how the company must move ahead.

**6. It Helps in Providing a Continuous Feedback System.**

When continuous feedback is provided, employees can improve their performance continuously.

**Benefits of Performance Appraisal for the Organization.**

1. It provides the organization with a platform that facilitates recognizing and stimulating hidden talents.
2. It also allows the organization to understand its staff's strengths and weaknesses so appropriate measures can be taken to provide training and development facilities to its team.

**Methods of Performance Appraisal Followed By Organizations**

1. Management by Objectives: Here, the team comprising of management and employees work, discussing, and identifying the goals that employees can achieve. Based on this, both frequently meet to review employees' progress and make necessary adjustments to goals and objectives.
2. 360-degree feedback: It is designed to obtain input from key players that employee interacts with in day-to-day activities, such as managers, supervisors, peers, subordinates, etc. It is helpful to measure behaviors and competencies. It throws light on how others perceive an employee. It also measures competencies relating to teamwork, character, and leadership.
3. Behaviorally anchored rating scale: It rates the employees and trainees according to their performance and specific behavioral patterns. It benefits both qualitative and quantitative data in the employee appraisal process.
4. Assessment Center: It allows employees to get a clear picture of their performance and helps them understand how others observe them. This is done by assessing their performance in role-playing, decision-making, and informal discussions.
5. Human Resource Accounting Method: In this method, employees' performance is evaluated and compared against the salary and other costs the company pays to the employees. It is a method whereby the company appraises employees considering the cost incurred and the value offered by the employees.
6. 720 Degree Method: Here, employee assessment is done not only by the stakeholders within the company but also by outsiders such as customers, investors, suppliers, and financial institutions.

**Drawbacks in the Performance Appraisal Process**

The Halo effect is caused when evaluators tend to be influenced by favoritism. Here the evaluators tend to be affected by the previous judgments of the employee. Authority figures also tend to be more strict or lenient with their evaluation. Sometimes recent events before the appraisal process can tend to overshadow the entire evaluation making it difficult to judge the continued performance of the employee. Unqualified and biased managers can wrongly assess the employees, creating issues that can prove detrimental to the company's progress.



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**Impact of Performance Appraisal on the Productivity of Employee**

Employee Productivity is productivity in the workplace. It measures the individual employee's overall output. The widespread success of an organization has everything to do with how effective and productive its employees will be in the organization.

Performance appraisal can shed essential insights on the employee's job description and helps the organization to ensure that the purpose, duties, and responsibilities are relevant to the organization's growth.

It provides the organization with frequent feedback on employee performance and encourages setting performance objectives with results that can be measured.

It also allows the organization to undertake training and development programs that can be instrumental in providing the much-needed training to employees, which can again contribute to increasing employee productivity.

Supervisors use performance appraisals to help the employees better understand their roles and responsibilities, allowing them to identify their weaknesses and improve their productivity.

Performance appraisals assist the organizations in identifying areas, not in line with the overall objectives, so adequate measures can be adopted to bring the proper direction to the work undertaken.

Organizations are better positioned to discover valuable talent and unique skill sets of specific employees; accordingly, rewards and benefits can be extended to them.

It gives the organization a platform where employees can share their grievances and feedback, which can be utilized to make corrections in company policies. It can be used to see the progress made in different areas in the long run.

**CONCLUSION**

It can be concluded that if a Performance Appraisal System is in place in organizations, it can yield better results in terms of growth and performance. It will require time and attention to detail on organizations' methods and techniques to appraise their employees. Organizations must be focused and vigilant in hiring the correct managers who will add value to the organization by identifying employee weaknesses and strengths. It is a process that requires the combined effort of the organization in every area. But if done with due diligence, it will increase employee productivity in the long run.

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**IMPLEMENTATION OF A DIGITAL-BASED OUTPATIENT HEALTH SERVICE SYSTEM IN  
QUALITY IMPROVEMENT SERVICES FOR SILOAM HOSPITAL KUPANG**

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**ABSTRACT**

*RSU Siloam Kupang is one of the hospitals that has tried hard to serve the people of Kupang city with the maximum service. In serving patients during the pandemic, the Siloam Kupang Hospital continues to maximally carry out a digital-based service system so that the authors are interested in identifying the implementation of a digital-based outpatient health service system in improving the service quality of Siloam Kupang Hospital.*

*This study uses a qualitative descriptive approach while the data sources used in this study consist of two types, namely primary data and secondary data. Then the data collection techniques in this study are through in-depth interviewing, observation and documentation, as well as equipped with audiovisual materials that allow to be taken in the field while the data analysis technique in this study uses the model proposed by Miles and Huberman (1992:16), that the analysis consists of three streams of activities that occur simultaneously, namely: data reduction, data presentation, conclusion drawing/verification.*

*The results of the study found that in its implementation it has not been fully implemented optimally if we look at the communication that runs in all parts or work units that have used mysiloam, it is still not running optimally, sometimes there is still miscommunication, especially on the problem of sudden leave of doctors practice, resulting in losses in patient. And also the mysiloam system is still not stable, so officers still often feel miscommunication that occurs in the mysiloam system and also on the stability of the network.*

*Keywords: Service, Health and Digital*

**1. INTRODUCTION**

The development of technology in the digital direction is currently growing rapidly. In this digital era, humans in general have a new lifestyle that cannot be separated from all-electronic devices. Technology has become a tool that can help most of human needs. Technology has been used by humans to make it easier to do any task and job. This important role of technology has brought human civilization into the digital era.

In the midst of limited space during the Covid-19 pandemic, Indonesia is focusing its development through digital transformation. For example, the implementation of various services and online command centers by various government and private sectors to reduce physical contact. Several regions in Indonesia are also implementing digital transformation by carrying out development using digital technology. Like a smart village in Central Java that utilizes internet access to carry out daily activities. In addition, one area that is currently accelerating digital transformation is DKI Jakarta. Through Jakarta Smart City, various innovative technologies are developed to solve various city problems. One of the efforts made is to provide integrated digital services in one application through JAKI (Jakarta Kini). In addition, there is also Rapid Community Response (CRM), an integrated system in the form of a mobile and web application used by the DKI Jakarta Provincial Government to follow up on citizen reports more efficiently (Mike Nafizahni. 2021).

Departing from the various digital transformations carried out by the government above, when we look at the health side of today, the challenge is how technology changes the way we treat patients. The digitization of health services is no longer a mere existence, but will become a basic need in running a business in the health industry. Digitalization will bridge the gap in terms of time, distance, and expectations, between consumers and health service providers, such as doctors and hospitals. And digitalization is simplification of access to health services.

The government through the Ministry of Communication and Informatics is currently serious about accelerating the national digital transformation. The momentum according to the direction of Mr. President Joko Widodo should not be missed and should instead be taken advantage of. This effort is included in the broad frame of the National Digital Transformation Acceleration agenda, said Minister of Communication and Information Johnny G. Plate when opening the Telemedicine Public Discussion for Improving the Quality of Health Services from the Multipurpose Room of the Ministry of Communications and Informatics, DKI Jakarta Province. In the national agenda, there are five priorities, as follows:

1. Completion of high-speed internet infrastructure in 12,548 villages/kelurahan and 150,000 public service points (including health services) that have not yet been reached by adequate internet services.

2. Development of the National Data Center (PDN) which is a prerequisite for the realization of the One Data Indonesia policy; and farming and refarming of radio frequency spectrum for network efficiency and 5G technology development.
3. Comprehensive and sustainable development of Human Resources (HR) in the digital field starting from the level of “digital literacy”, “digital talent”, to the level of “leadership of the digital era”.
4. Strengthening the digital economy ecosystem by facilitating programs, such as MSMEs/UMi selling online, digital technology by farmers/fishermen, and digital startups.
5. Completion of primary legislation supporting the digital ecosystem, especially the Bill on the Protection of Personal Data and the Bill on Job Creation in the telecommunications/ broadcasting sector, which are expected to be able to encourage the acceleration of the digitalization of national television (indonesiabaik.id, august 2020).

In addition to telemedicine, several other health technologies in the industrial era 4.0 that have been developed and utilized by various service facilities include artificial intelligence, blockchain, IoT (internet of things), and robotic services. Along with the various advances that have been made, more and more health companies see that technology is not only used as an infrastructure but also as a strategic asset. From this fact, the idea arises that optimally utilized technology will provide insight or input that is very useful for business progress. Appropriate data analysis can be used to improve service access to the community, increase the effectiveness of human resources, improve service quality, and reduce health care costs (admin, persi. 2020) .

The use of health technology among consumers also opens up opportunities for patients and their families, so that it is easier to get information and understanding about diseases, treatment options, as well as easily access and choose hospitals or health facilities that suit their needs. By realizing the benefits of digital transformation, more and more companies operating in the health sector, including hospitals, are taking the initiative to adopt this digital transformation into their management systems to produce better quality health services. Of course, we also need to know some of the benefits that consumers or patients can get in connection with the development of digitalization in the health 4.0 era, including:

#### **1. Patients Are Directed to Find The Right Doctor According to Their Needs**

In this case, the public has the right to seek detailed information about the type of doctor they need, for example what specialization, what hospital practice, educational background, and medical experience they have. By finding the right doctors and health facilities, the level of patient satisfaction is also expected to increase.

#### **2. Communities Can Get Equal Access to Health**

With digital technology, it is very possible that access to health can also be obtained by people in remote areas.

#### **3. Consumers Get Information About The Accountability of A Health Service**

expectations of the health care system are increasing. When patients are dissatisfied with a service, they can immediately express it on their social media accounts. The fact that there is still a lack of feedback in health technology can be a consideration for us to adapt this in this digital 4.0 era.

#### **4. There is Financial Transparency In The Health Sector**

Currently, there are still many disparities in terms of health costs that must be borne by consumers. The inequality in question is that people often do not know clearly how much they have to spend to get access to a service. The difference in the value of service costs between facilities is also a problem. With digitalization technology, it is hoped that the problem of transparency in health costs can be minimized.

#### **5. Harmonious Interactions that Occur Between Doctors and Patients**

Patient interactions with qualified doctors are very rare. According to a survey, only about 20-30% of patients have digital access to medical consultations or electronic reminders . The healthcare industry requires a patient-centred approach. Digital transformation is expected to be a solution so doctors can dig deeper information about their patients.

The various benefits that exist in the health era 4.0 should make the health industry in Indonesia increasingly take the initiative and have the competitiveness to participate in developing a similar system in their respective service facilities and allow an individual to have a healthier life, a longer life expectancy, and a better life. more productive.

In Indonesia, there are quite a number of hospitals that have implemented a digital-based health service system, such as:

**1). University of Indonesia Hospital (RSUI)**

RSUI is the first digital PTN Hospital in Indonesia that implements an operational management system based on network information technology from end to end (front end-to-back end). RSUI has a database with a storage capacity of 500 TB. This database is connected to all mechanical-electrical systems, medical service systems, nursing service systems, medical support systems, non-medical support systems and operational management systems on all floors in the hospital complex (Copyright 2021 RSP-UI) .

**2). Pondok Indah Hospital Jakarta**

Pondok Indah Group Hospital implemented the first digital hospital information system in Indonesia in 2014. With an online-based system and all data recorded electronically, the use of paper is reduced (paperless), which has a positive impact on the environment. Yanwar Hadiyanto, CEO of Pondok Indah Group Hospital said the environmentally friendly information system (Digital System) is comprehensive, which is implemented both in patient administration, as well as clinical services and medical support ( Deliana Pradhita Sari. 2014).

**3). Pelni Hospital Jakarta**

Not wanting to be left behind in technological developments, slowly but surely, the Pelni Hospital is transforming its corporate nature from the principle of volume-based care to value-based care. Under the leadership of Fatema who is the head of the Jakarta Pelni Hospital, various innovations have transformed the Pelni Hospital into a classier hospital with excellent service. "We want to make Pelni Hospital a smart hospital, where people can contact the Pelni hospital either directly or in cyber space using Industry 4.0," said Fatema. As is known, smart hospital is a smart hospital concept that focuses on optimizing patient services in hospitals by using internet-based information technology systems and supporting connectivity of medical and non-medical equipment, so as to provide quality and satisfying services for patients (Makro. July 2019) .

**4). Siloam Hospitals/ Siloam Hospitals**

Lippo Group is reportedly focusing on its core healthcare business by developing hospital applications and health services in 2021. This application is said to increase patient access to doctors. To improve the ease of service, Siloam Hospitals innovates and provides outpatient services that can be accessed online. This is a form of Siloam Hospitals' support for large-scale social restrictions (PSBB), so that people can still access health services from outside the hospital. "Continuity is very important in the management of chronic disease. Do not let the patient's treatment be interrupted because of PSBB. Many diseases, especially chronic diseases such as diabetes, heart disease, and hypertension will become a bigger problem if they are not monitored and treated regularly. Therefore, Siloam Hospitals uses technology so that patients can still seek treatment even if they do not come to the hospital. With the extensive network of Siloam Hospitals, this service also allows for online consultations between regions or cities," said Caroline Riady, Deputy Director of Siloam Hospitals (republika.co.id.2021).

Of the several hospitals above that have implemented a digital-based health service system, there are many more hospitals in various provinces and regions in Indonesia that have also transformed into a digital-based health service system, one of which is in the Province of East Nusa Tenggara, especially in the city of Kupang. namely Siloam Kupang General Hospital. Of the many hospitals in the city of Kupang, Siloam Hospital Kupang is one of the hospitals that has worked hard to serve the people of Kupang city with the maximum service. In serving patients during the pandemic, the Siloam Kupang Hospital continues to maximize its efforts to carry out a digital-based service system, by collaborating with application provider vendors such as Aido and also Siloam Group's own flagship application, the MySiloam application, to continue to assist the NTT community in providing maximum health services. .

With regard to the design of a digital strategy in an organization, the organization of the Siloam Kupang RSU located in the province of East Nusa Tenggara will be the main object of this research, in order to improve the quality of the organization's services to the community in the health sector. RSU Siloam Kupang is also the first hospital in East Nusa Tenggara province that has been accredited B from the Hospital Accreditation Committee (KARS) since November 8, 2018, and is at a 5-star rating with a Plenary level accreditation status, which accommodates referral services from hospitals. districts.

## Komisi Akreditasi Rumah Sakit (KARS) Hospital Accreditation Commission (KARS)

Seluruh rumah sakit Siloam Hospitals memiliki akreditasi dari Komisi Akreditasi Rumah Sakit (KARS) akan tetapi karena pandemi COVID-19, pengurusan dan/atau perpanjangan beberapa unit rumah sakit tertunda.

All units of Siloam Hospitals have accreditation from the Hospital Accreditation Commission (KARS), however due to the COVID-19 pandemic, the arrangement of adding several accreditations to and/or renewal of some hospital units was delayed.

No	Wilayah Region	Nama Rumah Sakit Name of Hospitals	Standar / Versi KARS Standard/ Version	Tanggal Mulai Survei Survey Start Date	Tanggal Masa Berlaku Expiration Date	Status Status	Star Rating out of 5
1.	1	Siloam Hospitals Kebon Jeruk	2012	18 Juli 2017 July 18, 2017	17 Juli 2021 July 17, 2021	Tingkat Paripurna Plenary Level	5
2.	1	Siloam Hospitals Lippo Village	2012	3 Oktober 2017 October 3, 2017	2 Oktober 2021 October 2, 2021	Tingkat Paripurna Plenary Level	5
3.	1	Paviliun B Siloam Hospitals Lippo Village	2012	3 Oktober 2017 October 3, 2017	2 Oktober 2021 October 2, 2021	Tingkat Paripurna Plenary Level	5
4.	1	MRCCC Siloam Semanggi	2018	17 September 2018 September 17, 2018	16 September 2021 September 16, 2021	Tingkat Paripurna Plenary Level	5
5.	1	Siloam Hospitals TB Simatupang	2018	3 Desember 2018 December 3, 2018	2 Desember 2021 December 2, 2021	Tingkat Paripurna Plenary Level	5
6.	1	Siloam Hospitals ASRI	2018	23 April 2019 April 23, 2019	22 April 2022 April 22, 2022	Tingkat Paripurna Plenary Level	5
7.	1	RSU Siloam Kelapa Dua	2018	24 April 2019 April 24, 2019	23 April 2022 April 23, 2022	Tingkat Madya	3
8.	1	Siloam Hospitals Cinere	2018	22 Mei 2019 May 22, 2019	21 Mei 2022 May 21, 2022	Tingkat Paripurna Plenary Level	5
9.	2	Siloam Hospitals Lippo Cikarang	2012	26 Juli 2017 July 26, 2017	25 Juli 2021 July 25, 2021	Tingkat Paripurna Plenary Level	5
10.	2	Siloam Hospitals Purwakarta	2012	28 November 2017 November 28, 2017	27 November 21 November 27, 2021	Tingkat Paripurna Plenary Level	5
11.	2	Siloam Hospitals Sentosa	2018	31 Oktober 2018 October 31, 2018	30 Oktober 2021 October 30, 2021	Tingkat Utama Primary Level	5
12.	2	Siloam Hospitals Yogyakarta	2018	14 November 2018 November 14, 2018	13 November 2021 November 13, 2021	Tingkat Paripurna Plenary Level	5
13.	2	Siloam Hospitals Bekasi Sepanjang Jaya	2018	28 November 2018 November 28, 2018	27 November 2021 November 27, 2021	Tingkat Paripurna Plenary Level	5
14.	2	Siloam Hospitals Bogor	2018	28 November 2018 November 28, 2018	27 November 2021 November 27, 2021	Tingkat Paripurna Plenary Level	5
15.	2	Siloam Hospitals Cirebon	2018	18 Desember 2018 December 18, 2018	17 Desember 2021 December 17, 2021	Tingkat Madya	3
16.	2	Siloam Hospitals Bekasi Timur	2018	9 Januari 2019 January 9, 2019	8 Januari 2022 January 8, 2022	Tingkat Paripurna Plenary Level	5
17.	2	RSU Siloam Syubbanul Wathon	2018	6 Mei 2019 May 6, 2019	5 Mei 2022 May 5, 2022	Tingkat Utama Primary Level	4
18.	3	BIMC Nusa Dua	2018	15 Februari 2017 February 15, 2017	17 Desember 2022 December 17, 2022	Tingkat Paripurna Plenary Level	5
19.	3	Siloam Hospitals Kupang	2012	20 November 2017 November 20, 2017	19 November 2021 November 19, 2021	Tingkat Paripurna Plenary Level	5

**Figure 1.1:** Hospital accreditation of Siloam Kupang, 08 Nov 2018

The Ministry of Health of the Republic of Indonesia requires the implementation of hospital accreditation with the aim of improving the quality of hospital services in Indonesia. The legal basis for implementing hospital accreditation is Law No. 36 of 2009 on health, Law no. 44 of 2009 concerning hospitals and Permenkes 1144/Menkes/Per/VIII/2010 concerning the organization and work procedures of the ministry of health. Accreditation means an acknowledgment given by the government to a hospital because it has met the established standards. Hospitals that have been accredited have received recognition from the government that everything in it is in accordance with standards. The facilities and infrastructure owned by the hospital are up to standard. The procedure performed on the patient is also in accordance with the standard (Puti Aulia Rahma, 2012).

Talking about the fulfillment of service standards means talking about the fulfillment of quality and service quality. One of the main requirements for health services is quality, which refers to the level of perfection of health services provided, which on the one hand can satisfy service users, and on the other hand the procedures for its implementation are in accordance with the code of ethics and standards that have been set. Likewise, the Siloam Kupang general hospital has service quality standards that are in accordance with the hospital's vision and mission, namely international quality standards and being a trusted choice in world-class holistic health services, health education and research.

Digital implementation in the current digitalization era is very influential in improving the quality of hospital organizations. Utilization of health service technology among consumers also opens up opportunities for patients and their families, so that it is easier to get information and understanding about diseases, treatment options, and easily access and choose hospitals or health facilities that suit their needs. By realizing the benefits of digital transformation, more and more companies are engaged in the health sector, one of which is the Siloam Kupang general hospital, which has also implemented digital transformation into the health care system to produce better quality health services.

In the process of improving the quality of better health services, Siloam Hospital has used a digital-based health service system, namely MySiloam which is the flagship application of the Siloam Group itself. With this digital-based service system, the Siloam Kupang general hospital hopes to minimize things that used to happen in the past and even often happened in providing health services, so as to improve several important things in a health service, such as:

### 1. Service Efficiency

With the digitization of hospital services, later the health services presented will become more efficient and optimal so that patients will easily get health services.

### 2. Avoid Stacking Queues

Queues that accumulate in hospitals can create boredom for patients who wait too long, can also cause disputes between patients and staff and even patients with patients, can also be a place that is prone to viruses and diseases. Therefore, digitizing hospital services is able to cut queues by providing education to patients to register online, be it through a smartphone application, the hospital's official website, or also WhatsApp.

### 3. Support Paperless Movement

In order to participate in reducing paper use and protecting the environment, as well as reducing hospital spending in excessive paper purchases, digitizing hospital services can be the right choice.

### 4. Faster Dissemination of Information

Health services are not the only ones who will benefit from the digitization of hospital services. The dissemination of information and also counseling related to a disease or pandemic that attacks an area also becomes faster. That way, the risk of spreading disease due to viruses or bacteria can be minimized.

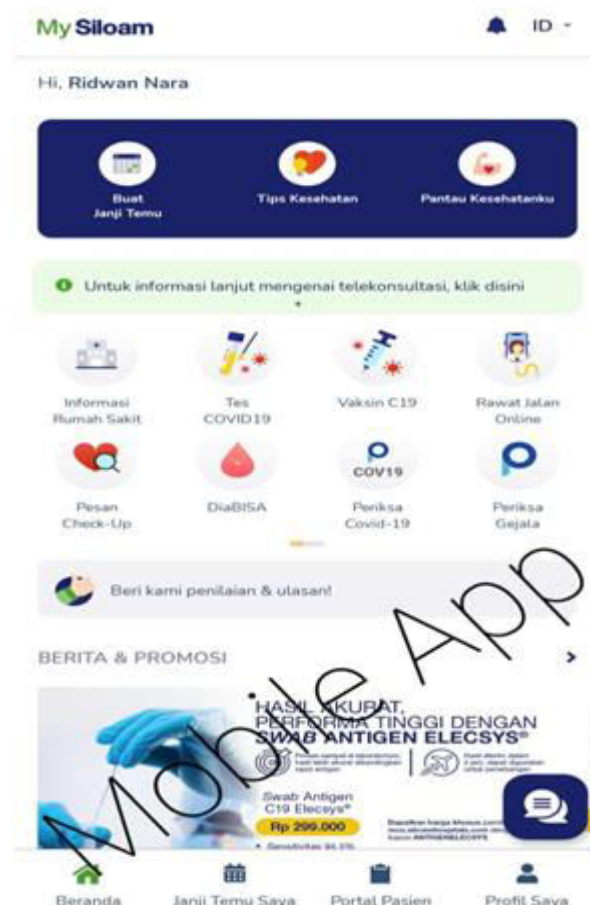


Figure 1.2 : MySiloam Mobile App

From some of the things above that usually occur, it is hoped that the use of a digital-based health service system can support or improve the quality of health services at the Siloam Kupang public hospital to be better in the future. In using a digital system to get a health service at the Siloam Hospital Kupang, it is available in web and mobile form which can be directly obtained by downloading the mysiloam application on the Playstore on Android type phones, and also in the Webside model which can be opened using link <https://www.siloamhospitals.com/bpjs>.



With the mysiloam application, all service activities ranging from information services, meeting services, health check services, health monitoring services, article services and health tips, and many other services have been integrated into a mobile health application. The application of mysiloam in digital services at the Siloam Hospital in Kupang has not yet been fully implemented, for example, currently the outpatient service using mysiloam is still divided. For outpatient services specifically for BPJS patients, they still use the mysiloam web and for mysiloam mobile it is only used for general patients and insurance only. the mysiloam application is also still not complete with existing features so that it is not optimal in the service process to the community. For medical check-up (MCU) services, they only serve private and insurance patients and not BPJS patients. Meanwhile, to get virtual doctor consul services, Siloam Hospital Kupang still uses the Aido application which is still working with vendors, and has been running since mid-2020 until now.



Figure 1.3 Online Reservation Flow vs Walk In

From the picture of the online reservation flow above, it is clear that the time difference between the 2 procedures is clear, where the online reservation procedure is shorter than the manual or walk-in procedure. So from the general explanation above, it can be seen that some of the services provided have indeed used a digital system to improve the quality of the Siloam Kupang General Hospital, but are still not completed, all are still independent, there are also many obstacles faced so that it can be said that the service is by using a digital system that is run is not optimal, but all systems are well integrated.

Therefore, to analyze the success rate of implementing a digital-based health service system in improving the quality of the Siloam Kupang public hospital, the authors use the policy implementation theory model from Charles O. Jones (1996:166) which says that, Policy implementation is an activity intended to operate a program by taking into account three main activities. According to Jones, these three activities can affect policy implementation. The three activities referred to are: 1) Organization, formation or realignment of resources, units and methods to support the program running, 2) Interpretation, interpreting so that the program becomes a plan and direction that is appropriate and acceptable and implemented, and 3) Application (application), relating to the implementation of routine activities which include the provision of goods and services.

Based on what was stated by Charles O. Jones, the problem of implementing public policy is getting clearer and wider, where implementation is a process that requires systematic actions as described above, so that it can be seen whether the implementers of the policy in this case are Siloam Kupang general hospital management in making a policy has been in accordance with what is expected, it can also be seen whether a policy in this study is influenced by an environment and whether there have been changes as desired. As well as studying the supporting and inhibiting factors in an implementation of the digital system.

Jones (1984:12) defines policy implementation as "getting the job done and doing it". This understanding is a simple understanding, but it does not mean that implementation is a policy process that can be implemented easily. In its implementation, according to Jones, it requires the existence of conditions, among others, the presence of people or implementers, money and organizational abilities. The implementation of public policy emphasizes the actions taken by the government or individuals, groups or private parties that are directed to achieve the goals that have been set in policy decisions.

Policy implementation basically also measures the success or failure of a policy outcome that is actually implemented in the field by implementers and how it impacts the community and its stakeholders, as well as



reviewing and studying the supporting and inhibiting factors in the process of implementing the digital service system. So that a joint commitment is needed from various parties such as hospital management, the government in this case the relevant ministries, professional associations, and implementing doctors to be able to always collaborate and be open to the renewal process as well as the need for clear regulations and support the growth of the system with one goal, namely improving quality. Hospital health services.

## **2. LITERATURE REVIEW**

### **2.1 Public Policy**

State policies and policies are often referred to as public policies, state policies or government policies actually have the same meaning. Friedrich 1969 in Agustino (2016:16) states that a policy is a series of actions proposed by a person, group, government or a certain environment by showing the obstacles of opportunities to the implementation of the proposed policy in order to achieve certain goals.

Another definition of policy put forward by Nugroho (2006:23) is to formulate an understanding of public policy. First, public policies are policies made by state administrators or public administrators. So, public policy is everything the government does and does not do. Second. Public policy is a policy that regulates public life or public life, not the life of an individual or individual.

Meanwhile, Parsons (2006:15), gives the idea that policy is a set of actions or plans that contain political goals. According to him, the word policy implies policy as a rationale, a manifestation of judgmental judgment. This means that a policy is an attempt to define and develop a rational basis for doing or not taking an action. Furthermore, Nurcholis (2007:263), provides a definition of policy as a decision of an organization that is intended to achieve certain goals, contains provisions that can be used as behavioral guidelines.

### **2.2 Policy Implementation**

According to Oktasari (2015:1340), implementation comes from English, namely to implement which means to implement. Implementation is the provision of means to carry out something that has an impact or effect on something.

Implementation according to Jones theory (Mulyadi, 2015:45): "Those Activities are directed toward putting a program into effect" (the process of realizing the program until it shows the results). Meanwhile, according to Horn (Tahir, 2014: 55), "meaning implementation as actions taken by individuals/officials or government or private groups directed at achieving the goals outlined in the policy".

#### **2.2.1 Charles O Jones Policy Implementation Model**

Charles O. Jones (1996:166) suggests about policy implementation, namely: implementation is the set of activities directed toward putting a program into effect. of three very important main activities, namely organization, interpretation, and application.

Based on this theory, in the implementation of public policy there are three main activities that are very important. The first activity is the policy implementing organization, which includes the establishment or rearrangement of resources, units and methods to make the program work. Then the second activity is the interpretation of policy implementers, namely the activities of policy implementers who interpret so that the program becomes a plan and direction that is appropriate and can be accepted and implemented. Finally, the third activity is the application or implementation by policy implementers that include routine provisions of services, or others that are tailored to the objectives and program equipment of predetermined public policies.

Based on what was stated by Charles O. Jones, the problem of implementing public policy is getting clearer and wider, where implementation is a process that requires systematic actions consisting of organization, interpretation and application. As well as what supporting and inhibiting factors will be experienced or faced in the process of implementing a digital-based health service system.

In the implementation of a digital-based service system implemented by the Siloam Kupang hospital in the outpatient registration process at outpatient poly services, based on the results of observations and initial interviews based on a theoretical study of policy implementation put forward by Charles O. Jones with three main activities as follows: following:

#### **1. Organization**

The success of policy implementation according to Charles O. Jones must have an organization or institution that implements it. Jones (1994:166), says organization is "an activity related to the formation or rearrangement of resources, units and methods to make the program work". For Jones (1994:296) bureaucratic organization is

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concerned with (a) the formation or rearrangement of resources, (b) units, and (c) methods to make the program work. Thus, these three aspects will be discussed as follows:

**a. Resource**

Resources in policy implementation can be seen as one of the critical factors of public policy implementation. Resources that are important in policy implementation include staff of sufficient size, and possessing the appropriate skills to complete their duties, the authority and facilities necessary to translate written proposals into government functions. These policy resources must also be available in order to facilitate the implementation (implementation) of a policy. Lack of Human Resources, limited funds or facilities in policy implementation, is a major contribution to the failure of policy implementation.

**b. Units / Organizational Structure**

Bureaucratic organizations are organizational units where organizational units are part of a large model, namely structure. Structures are the formal mechanisms by which organizations are managed, Handoko (1998:169) says that: "the structure shows the framework and arrangement of the embodiment of a fixed pattern of relationships among functions, sections or positions, as well as people- people who show different positions, duties, authorities and responsibilities in an organization. The structure aims to organize and distribute work among members of the organization so that the activities carried out can run and achieve the goals and objectives of the organization. The structure/unit arrangement needs to be regulated through clear rules that limit the authority of functions, sections or positions, not being bypassed by the bureaucracy. The existence of clear order will be able to eliminate overlapping employee duties, as well as clear regulations will be able to create standard work procedures.

**c. Method**

According to Agus M. Hardjana. (2003) The method is a series of process activities that must be carried out to increase the usefulness of all sources and factors that determine the success of the management process, especially by paying attention to the functions and dynamics of the organization or bureaucracy in order to achieve legitimate goals, the method is no less important in achieving goals. With the method in an organization, the organization will be easier and more organized in achieving the goals, vision and mission that have been set.

**2. Interpretation**

The successful implementation of a digital-based service system, the most important thing is the understanding by all parties involved in the implementation and recipients of the policy on the implementation guidelines, therefore it is necessary to strive for mutual understanding between the implementing apparatus in this case the person in charge of the application, the Technician Team/IT Team, the FO Team as the operating staff of the MySiloam digital system/application service program and also the community as beneficiaries. Interpreting policies into the same perspective is not easy, because implementers may have different views from those of their superiors, and also differ from the views of policy makers. Therefore, according to Jones (1994:320) quoting the statement of George C. Edwards, said: "Those who implement decisions/policies must know what they should do. If the policy is to be implemented properly, the directives and implementation instructions are not only accepted but also must be clear and if this is not clear, the implementers will be confused about what they should do, and in the end they will have their own policies regarding the implementation of the policy.

**3. Applications/ Applications**

Application or Application is often a dynamic process in which the implementers or officers are directed by program guidelines and standards, or specifically directed by actual conditions. A policy will be successful/successful if it can be applied/implemented, otherwise it is just an empty hope. Therefore, Jones (1994:320) says application, is "a permanent provision in service to achieve program goals". Through this application, it is hoped that a response from the target group will appear. Strictly speaking, with the application of the policy, it will be known whether the environment accepts or rejects the implementation and results of the policy. Therefore, applying policies is not an easy thing, it can even pose challenges that must be faced by implementers, while application activities are activities of providing services on a regular basis or otherwise in accordance with the objectives and means of existing policies.

**2.3 Health Services**

According to Levey and Loomba as quoted by Isnati (2017: 153) explains that health services are an effort carried out individually or in groups in a health institution to prevent and improve health, maintain, and cure disease in individuals, groups, families and communities. .

According to Soekidjo Notoatmojo (2003:13), health services are an attempt from a pattern of health services that have the aim of providing preventive and (promotive) health services, the target of which is community groups.

From the definitions of health services above, it can be said that health services are efforts that are carried out alone or jointly in an organization to maintain and improve health, prevent and cure disease and restore the health of individuals, families, groups and or communities.

### **3.METHOD**

This study uses a qualitative descriptive approach while the data sources used in this study consist of two types, namely primary data and secondary data. Then the data collection techniques in this study are through in-depth interviewing, observation and documentation, as well as equipped with audiovisual materials that allow to be taken in the field while the data analysis technique in this study uses the model proposed by Miles and Huberman (1992:16), that the analysis consists of three streams of activities that occur simultaneously, namely: data reduction, data presentation, conclusion drawing/verification.

## **4. RESEARCH RESULTS AND DISCUSSION**

### **4. 1 Implementation of a Digital-Based Health Service System to Improve the Quality of Siloam Hospital Kupang**

The implementation of a digital-based service system implemented by the Siloam Kupang hospital in the outpatient registration process at outpatient poly services, based on the results of observations and interviews based on a theoretical study of policy implementation proposed by Charles O. Jones with three main activities as follows:

#### **1. Organizing**

The success of policy implementation according to Charles O. Jones must have an organization or institution that implements it. So based on Jones' statement above, RSU Siloam Kupang is an organization or institution that has implemented a digital/mysiloam-based health service system as stated by Charles O. Jones, there must be an organization or institution that implements so that a policy can run well and in accordance with the Vision. and Organizational Mission.

However, Jones also said that organization is "an activity related to the formation or rearrangement of resources, units and methods to make the program work". For Jones (1994:296) bureaucratic organization is concerned with (a) the formation or rearrangement of resources, (b) units, and (c) methods to make the program work. Thus, these three aspects will be discussed as follows:

#### **A. Resource**

Resources that are important in policy implementation include staff of sufficient size, and having the appropriate skills to complete their duties, the necessary authority and facilities. These policy resources must also be available in order to facilitate the implementation (implementation) of a policy.

From the information of several informants, it is known that the existing resources at the Siloam Kupang General Hospital are currently good and sufficient in carrying out the current digital-based health service process. Existing resources before being confronted with the new system had been provided with or initial training with knowledge of the new system to be operated, and all human resources employed at the Siloam Kupang hospital were workers with minimum educational criteria of a Bachelor's degree. Overall, it can be said that the process of a digital-based service system has been running well with supporting human resources.

#### **B. Units / Organizational Structure**

In a bureaucratic organization there are organizational units where the organizational units are part of a large model, namely the structure. Structures are the formal mechanisms by which the organization is managed. The structure aims to organize and distribute work among members of the organization so that the activities carried out can run and achieve the goals and objectives of the organization. The structure/unit arrangement needs to be regulated through clear rules that limit the authority of functions, sections or positions, not being bypassed by the bureaucracy. The existence of clear order will be able to eliminate overlapping employee duties, as well as clear regulations will be able to create standard work procedures.

In general, all units or parts related to the digital-based health care system/mysiloam system, all of them have understood and mastered the system because all units or parts have been trained specifically for the operation of the mysiloam system before it is run. So as to minimize errors that will arise from a lack of knowledge of the new system / Mysiloam system.

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**C. Method**

According to Agus M. Hardjana (2003), the method is a series of process activities that must be carried out to increase the usefulness of all sources and factors that determine the success of the management process, especially by paying attention to the functions and dynamics of the organization or bureaucracy in order to achieve legitimate goals, the method is no less important. role in achieving goals. With the method in an organization, the organization will be easier and more organized in achieving the goals, vision and mission that have been set.

The method used in the process of implementing a digital-based health service system at the Siloam Kupang general hospital is quite complete, namely by taking a comprehensive communicative approach and supported by social media in this case print and video media. So that the whole series of activity processes will be easier and more orderly in achieving the goals, vision and mission that have been set.

**2. Interpretation**

The successful implementation of a digital-based service system, the most important thing is the understanding by all parties involved in the implementation and recipients of the policy on the implementation guidelines, therefore it is necessary to strive for mutual understanding between the implementing apparatus in this case the person in charge of the application, the Technician Team/IT Team, the FO Team as the operating staff of the digital system/MySiloam service program and also the community as beneficiaries. Interpreting policies into the same perspective is not easy, because implementers may have different views from those of their superiors, and also differ from the views of policy makers. Therefore, according to Jones (1994:320) quoting the statement of George C. Edwards, said: "Those who implement decisions/policies must know what they should do. If the policy is to be implemented properly, the directives and implementation instructions are not only accepted but also must be clear and if this is not clear, the implementers will be confused about what they should do, and in the end they will have their own policies regarding the implementation of the policy.

FO officers who run services using the mysiloam digital system. It can be concluded that all units/parts already have the same interpretation or view, and understand this mysiloam digital system, only in terms of communication that runs in all parts or work units that have used mysiloam still not going well, because there are still miscommunications, especially on the problem of the doctor's sudden leave from practice, resulting in a loss to the patient. And also the mysiloam system is still not stable, so officers still often feel miscommunication that occurs in the mysiloam system and also on the stability of the network.

Mysiloam will be useless if neither party feels benefited. The beneficiary, in this case the patient, interprets the digital/mysiloam-based system in the reservation or registration process to the outpatient poly.

The above patients who will register to the outpatient polyclinic feel the same benefits as the online reservation or registration that is already running at the Siloam Kupang public hospital. Waiting times are faster, although there are also patients who find it difficult to register online, the Siloam Kupang hospital has provided a solution by preparing special officers to make online reservations.

**3. Application/ Application**

Application or Application is often a dynamic process in which the implementers or officers are directed by program guidelines and standards, or specifically directed by actual conditions. A policy will be successful/successful if it can be applied/implemented, otherwise it is just an empty hope. Therefore, Jones (1994:320) says application, is "a permanent provision in service to achieve program goals". Through this application, it is hoped that a response from the target group will appear. Strictly speaking, with the application of the policy, it will be known whether the environment accepts or rejects the implementation and results of the policy. Therefore, applying policies is not an easy thing, it can even pose challenges that must be faced by implementers, while application activities are activities of providing services on a regular basis or otherwise in accordance with the objectives and means of existing policies.

Based on the results of interviews with some of the informants above, it can be said that the implementation or application of a digital-based health service system at the Siloam Kupang Hospital has been going well and the expected results or desired goals with changes to registration which were previously manual to those now online are very different in terms of efficiency of patient waiting time and staff effectiveness in terms of patient registration.

#### 4.2 Factors that support and hinder the implementation of a digital-based health service system in improving the quality of the Siloam Kupang public hospital.

The implementation of public services in an agency is largely determined by the existence of supporting factors and inhibiting factors in the process of providing services to these patients/communities. The success of a service will be largely determined by the existence of several supporting factors, otherwise the failure of a service is caused by the presence of inhibiting factors that interfere with the process of implementing services to the community and can also reduce the quality of services provided. In connection with the implementation of a digital-based health service process at the Siloam Kupang public hospital, what was found to be a supporting factor and an inhibiting factor in the process of implementing a digital-based health service system at the Siloam Kupang public hospital from the results of an interview with an EP informant who is the ICT Department Head. at RSU Siloan Kupang or better known as IT Manager .

From the results of interviews with all the main informants above, it can be concluded that the first supporting factor in the implementation of a digital-based health service system at the Siloam Kupang public hospital is from the HR side. HR here are employees whose job is to operate mysiloam to IT employees who are always on standby to monitor the progress of the mysiloam system and network. Also full support from the Head Office and the management of the Siloam Kupang public hospital so that the digital-based health service system or mysiloam system can continue to run well until now. The inhibiting factor is more dominant from the side of the patient, which is quite a lot who do not understand mysiloam, especially elderly patients. And also obstacles due to weather and frequent power outages that affect existing servers and networks. All of this is clarified by the data on the number of outpatient poly visit patients who register online and walk in as below:

1	Hospitals: ["SHKP"]				
2	Date: 2022-01-01 - 2022-06-09				
3					
4	Doctor	Patient Total	Appointment	%Appointment	Walkin %Walki
5	dr. Kelvin Yuwanda, SpN	6229	1923	30.87%	4306 69.13%
6	HD - dr. Lanny Tanesia, SpPD, B.Min, M.Min, Finasim	3653	195	5.34%	3458 94.66%
7	dr. Eric Sebastian Huaturuk, SpU	3402	855	25.13%	2547 74.87%
8	dr. Oka Wijaya, SpP	3345	840	25.11%	2505 74.89%
9	dr. I Made Buddy Setiawan, M. Biomed, SpOT (K) Spine	2786	1164	41.78%	1622 58.22%
10	dr. Putu Novindra Pradipta, M.Biomed, SpPD	2681	908	33.87%	1773 66.13%
11	dr. Magma Purnawan Putra, SpJP	2236	1975	88.33%	261 11.67%
12	MR - dr. Dyah Gita Rambu Kareri, SpKFR	1958	583	29.78%	1375 70.22%
13	dr. Lanny Tanesia, SpPD, B.Min, M.Min, Finasim	1948	519	26.64%	1429 73.36%
14	dr. Firman Nugroho, SpU	1291	215	16.65%	1076 83.35%
15	dr. David Santosa, SpPD	1291	403	31.22%	888 68.78%
16	dr. Boyke Kuhurima, SpM	1286	422	32.81%	864 67.19%
17	dr. Santry Yusnita Sinatra, SpRM	1232	386	31.33%	846 68.67%
18	drg. Eny Wahyuni, SpBM	1166	982	84.22%	184 15.78%
19	dr. Made O. Mahendra, SpOT, M.Biomed	1095	311	28.40%	784 71.60%
20	dr. Leonora Johana Tiluata, SpJP	864	763	88.31%	101 11.69%
21	dr. Siemon Junior Berhimpon, SpB	738	123	16.67%	615 83.33%
22	dr. Herbert Soritua Silalahi, SpB	733	107	14.60%	626 85.40%
23	dr. Evivana Sri Sundari, MSc, SpKK	708	153	21.61%	555 78.39%
24	dr. Dyah Gita Rambu Kareri, SpKFR	676	230	34.02%	446 65.98%
25	drg. Yohannes D. Indrajati, SpKG	632	250	39.56%	382 60.44%
26	dr. Yosef Yanto Deventer Nyong Oematan, SpA	531	46	8.66%	485 91.34%
27	MR - dr. Santry Yusnita Sinatra, SpRM	517	107	20.70%	410 79.30%
28	dr. Ida Bagus Ngurah Wisesa, SpPD	377	75	19.89%	302 80.11%
29	dr. Imelda Rina, SpOG	321	57	17.76%	264 82.24%
30	dr. Jean Eleonora Pello, SpB	316	45	14.24%	271 85.76%
31	dr. Muhammad Ibrahim, SpTHT-KL	305	59	19.34%	246 80.66%
32	dr. Elrich Brahm Malelak, SpBS	300	38	12.67%	262 87.33%
33	dr. Laurens David Paulus, SpOG (K) Onk	294	194	65.99%	100 34.01%
34	dr. Isaiaas Budi Cahaya, SpOG	247	18	7.29%	229 92.71%
35	dr. Laila Fitri Ibbibah, SpA	242	34	14.05%	208 85.95%
36	dr. Richman Patandung, SpU	231	19	8.23%	212 91.77%
37	dr. Linda Arintawati M.Gizi, SpGK	229	77	33.62%	152 66.38%
38	dr. Widhitomo, SpB-KBD	210	43	20.48%	167 79.52%
39	dr. Donny Argie, SpBS	200	31	15.50%	169 84.50%
40	dr. Sugi Deny Pranoto Soegianto, M.Ked. Klin, SpA	184	35	19.02%	149 80.98%
41	dr. Niniek Widiandriany, SpKJ	139	38	27.34%	101 72.66%
42	drg. Lily Liana	125	23	18.40%	102 81.60%
43	dr. Sharon Sandra, SpPD	114	18	15.79%	96 84.21%
44	dr. Tri Nugraheni, SpPA	59	12	20.34%	47 79.66%
45	drg. Alice Ritliany	33	5	15.15%	28 84.85%
46	dr. Jenny Elisabeth Pally, SpOG	15	4	26.67%	11 73.33%
47	dr. Andreas Andhry Heru Tjahyono, SpOG	1	0	0.00%	1 100.00%
48					

Figure 4.22 Data Appointment vs Walk in 01.01.2022 - 09.06.2022

Based on the data above, which was taken from 01/01/2022 to 09/06/2022, the average patient registering/registering to the outpatient polyclinic tends to be walk-in registration, seen from the total number of specialist clinics with the number of patients and the percentage of Appointment vs Walk in patients in each poly, it is clear that patients tend to register by Walk in. only a few polyclinic, such as the Oral Surgery poly and the Cardiac polyclinic, the percentage of patients registering online tends to be higher because these polyclinics are indeed limited by visitors by the doctor concerned and patients are required to make an order at the CS counter to adjust the doctor's slot.

Based on observations obtained in the field, public enthusiasm for mysiloam services is quite high. However, despite the high enthusiasm of the community for this digital-based health service, there are still many people who do not master the use of IT so they cannot access the mysiloam system to register online. The level of IT mastery that differs from one individual to another makes this online registration system not well understood by patients in operating it. For this reason, patients or the public who cannot access and operate the features in the mysiloam system tend to choose the assistance of a reservation officer provided by the hospital.

## **5. CONCLUSION**

The implementation of the mysiloam system in the implementation of public services in the health sector at the Siloam Kupang public hospital can be concluded as follows:

1. The implementation of a digital-based outpatient health service system at the Siloam Kupang General Hospital has been going well. With the implementation of an online registration system using mysiloam, it has an impact on the community and health care workers, seen from indicators of service procedures, ease of access and service time. The procedure for patient registration services with the implementation of the mysiloam system reduces the flow of patient registration service procedures. The service time received by the community after the implementation of the mysiloam system became more efficient, without the need to spend a long time getting treatment. However, in its implementation, it has not fully run optimally if we look at the communication that runs in all parts or work units that have used mysiloam, it is still not running optimally, sometimes there is still miscommunication, especially in the case of sudden medical leave, resulting in losses to patients. And also the mysiloam system is still not stable, so officers still often feel miscommunication that occurs in the mysiloam system and also on the stability of the network.
2. The application of online registration through the mysiloam system in the provision of health services is influenced by supporting and inhibiting factors. Factors supporting the implementation of the mysiloam system at the Siloam Kupang general hospital are the presence of workers in this case human resources that are very adequate in terms of quality and quantity, as well as full support from the Head Office and Management, as well as the ability and commitment of employees who implement or operate the mysiloam system. this, as well as the mastery of IT personnel in monitoring and managing disturbances to existing systems and networks, thus making the mysiloam system run well so far. Inhibiting factors include operational technical disturbances such as disturbances to the internet network, servers, damaged computer equipment and frequent sudden power outages from PLN which trigger network disturbances. Another inhibiting factor is the limited IT control of the community/patients, not all people of Kupang City or hospital visitors are technology literate and able to operate the mysiloam system, especially the community/elderly patients, so that some people/patients feel more comfortable with the manual registration mechanism.

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## THE NEW AGE MEDIA- OVERPOWERING THE MODERN COMMUNICATION

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### OBJECTIVE

To know how:

A) **Science and Technology with ‘AI’** has impacted total Socio-economics.

It has led to new Lifestyle. And the New Age Media has emerged, taking a lead role to meet the needs of the changing Socio-economics. In the process, it is overpowering, today, the entire Communication Industry.

B) As a result, **Media has become New Creative** in Modern Communication.

(Backed by Artificial Intelligence with Digital platform.)

C) The scope for **‘Visual’ in Communication Industry** is ever widening, in the context of New Age Media (we are progressing from 2D, 3D, 4D, 5D and so on to Virtual Reality and Augmented Reality.)

### Scope

It's qualitative research that involves observations, examination and understanding of a Human, behaviour in regard with personal, Social and Business activities.

### Type of Research: Explorative

- Deals with the present opportunities and

- The future challenges, in new Socio-economic environment in regard with Communication Industry.

### Brief Background of the Subject:

The Title: The New Age Media- overpowering the Modern communication. To understand the meaning of the title (Subject), in totality, we need to understand and answer the following questions at deeper level.

Hence, the structure of the Paper is:

**Chapter 1) what is communication?**

**Chapter 2) what is New Age Media and**

**Chapter 3) how does it overpower the Modern Communication?**

### Chapter 1) What is Communication?

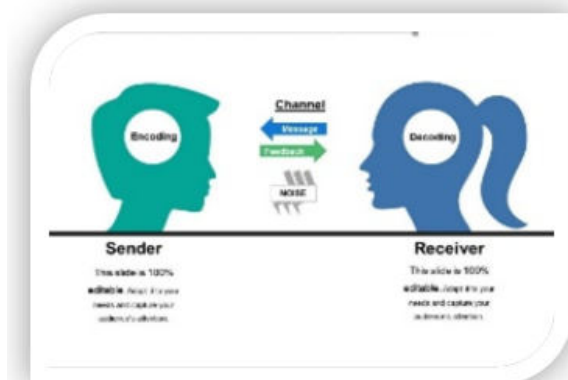
Communication is sharing thoughts, feelings, emotions and information.

It is an exchange of information.

-Communication involves **human psychology**. That's why it is prone to be subjective.

-Furthermore, being a **Mass communication**, it reduces the effectiveness of communication to a great extent.

And Communication task becomes even more challenging, especially, in the **diverse conditions of INDIA**, in the context of Geography, History and Cultural.



Why is encoding and decoding important in communication?

Encoding is the process of turning thoughts into communication. The decoding of a message is how an audience can understand and interpret the message. Decoding is the process of turning communication into thoughts again.

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.....  
.....

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**Chapter 2) what is the New Age Media?**

Communication has a close relation with media Forms since Media carries the message and also instrumental in defining the quality of Communication.

Communication, be it Personal, Business oriented or Social, combined with Media forms, it plays a vital role to inform, persuade, influence, convince and transform the desired audience for better living.

**The New Age Media backed by Science and Technology with Digital platform, has opened up new vistas for Communication Industry.**

To know the New Age Media, we need to understand, the Conventional media first.

**Conventional Media**

. What are Forms of the Conventional Media and its Strengths and Weaknesses?

**Print media** – Press and magazines, Brochures Leaflets etc.

**Outdoor Media** – Poster, Hoarding, other Sales promotional Materials.

**Electronic media** – TV, Radio (involves broadcasting)

**Print**

Includes all types of publications, including newspapers, journals, magazines, books and reports. It is the oldest type.

**Key Strengths:** Offers an opportunity to unfold the complete story. Enjoys comfortable time-span.

**Key Weaknesses:** Consumes more Time and Money. More wastage because of mix audience.

**OUTDOOR**

Hoardings, Posters, All Sales Promotional materials, Billboards including posters, bulletins, and painted walls. Sampling/Street Teams: Product sampling at high-traffic venues/locations. Telephone Kiosk etc. Printed displays on free-standing public telephone enclosures. Transit: Commuter transit platforms, Trains and buses.

**Key Strengths:** Basically, it is used as a Reminder medium. It also works well for promotion of your product/Brand in specific geographic areas.

**Key weaknesses:** Enjoys very short time for communication. Also restricts the message to minimum elements.

Electronics: Broadcasting media -Television, Radio.

Key strengths: Television is considered as the most powerful amongst all media, being an Audio-Visual medium. Radio is one of the cheapest media and has maximum reach.

TV. Enjoys captive audience.

**Key weaknesses:** Television is cost sensitive while Radio has no Visual support.

. WHAT ROLE DOES MEDIA PLAY IN COMMUNICATION?

**Etymology:** The word comes from the Latin Medius or medium, which means “the middle layer.”

The role of Media is to carry the message to desired audience in the most cost-effective way.

It informs, persuades, and entertains. It helps selling activity. It also becomes instrumental in educating and culturing the society.

Every medium has its own in-built strengths and weaknesses. The medium selected for an advertisement also determines the quality of the end Communication.

Factors that determine the end quality of the communication, in regard with Media are:

**Reach, Frequency, Selectivity, Durability, Sustainability, lead-time, Mechanical requirements, Clutter and Cost.**

**Impact of media on society is enormous:**

**That's why Media is considered the 4th Estate of a country.**

1. Media provides news and information required by the people.

2. Media can educate people.
3. Media helps in democracy function effectively. They inform the public about government policies and programs and how these programs can be useful to them. (Pulse Polio Campaign) Make in India.
4. Media can entertain people.
5. Media can act as an agent of change in development.
6. Media has brought people of the world closer to each other.
7. Media promotes trade and industry through advertisements.
8. Media can help political and democratic process of country.
9. Media can bring in positive social change.

**Hence, In Totality, Medium Defines The Scope Of A Visual** Because Of Following Reasons:

Media carries the message.

Medium determines the quality of Communication depending upon its characteristics and selection.

Medium defines the scope of a Visual in Communication, based on its Technological characteristics.

In Mass communication, Media Strategy plays a vital role in Communication. (Integrated Marketing Communication)

#### **New Age Media – (It Was the Need for Change)**

1. Science and Technology impacted total socio economics politics and business environment.
2. As a result, a new lifestyle is born. (Letter is replaced by email, dr. consults online)

In difficult times of pandemic, education has become online. Online banking.

Operations)

That's why Role of communication has changed to meet the new needs.

3. And the new media has appeared in various forms with the help of Science and Technology.

#### **The Changing Lifestyle of A New Socio-Economy Has Also Changed the Way People Communicate.**

In the following pictures, it is not just a humour. It reconfirms that fabric of entire Socio-economics is changing.



Science and Technology has made human life 'Fast -forward' and Digital media keeps it connected.

This has impacted greatly on Socio-economy and human behaviour.

#### **Human Life Has Been Revolving Around Three Screens:**

##### **1) T.V. 2) Computer and 3) Mobile Screen.**

Technology affects **the way individuals communicate, learn, and think**. It helps society and determines how people interact with each other on a daily basis. ...

...It has made learning more interactive and collaborative, this helps people to get into better engagement.

Science and Technology impacted total socio economics politics and business environment,

Technology has advanced into many areas of our lives, making information more accessible, improving communication, changing transportation, and the list goes on...

The scope of communication varies as the medium changes with time and place.

**Media Carries The Message. and Sometimes Medium Becomes A New Creative.**

Every medium has its own in-built strengths and weaknesses.

While the in outdoor medium, Visual communication dominates text part, invariably, in the case of Print and indoor medium, Communication becomes more and more interpretative revealing the complete story of a product/Brand.

See, how the media forms have changed radically over the years. Its style of news making & delivering, presentation- everything.

I would give a simple example. Just imagine how the news anchor of 90s used to deliver a news bulletin on TV & how a news anchor these days delivers a news.



Anchor in 90s -Figure No 1



Anchor in present- Figure No 2

One demerit of traditional media is that it requires a large advertising budget as against Digital and social media. This is also one of the key reasons of the popularity of new age media.

New media doesn't necessarily refer to a specific mode of communication. Some types of new media, such as an online newspaper, is a new version of "old media".

Other new media are entirely new, such as a podcast or smartphone app. Technology continues to advance, and the definitions will keep on absorbing new terms.

New media is any media – from newspaper articles and blogs to music and podcasts – that are delivered digitally. From a website or email to mobile phones and streaming apps, any internet-related form of communication can be considered new media. It also constantly changes. As new technology is developed and widely adopted, what is considered new continues to morph. Once upon a time, DVDs and CDs were the latest way to watch movies and listen to music. Now, streaming services such as Netflix and Spotify are more popular.

Just a few examples of new media include:

- Websites
- Blogs
- Email
- Social media networks
- Music and television streaming services
- Virtual and augmented reality

"I think the most important thing to know about new media is that it is always changing," Bord said. "Though this does make it a challenging field because professionals have to be aware of the constant changes in trends and technologies,

The word "media" applies to many things in the 21st century, from mass media to news media, and traditional media to the many emerging forms of digital media. While you can likely come up with several different examples — and almost certainly you take in some form of media in your everyday life - it is difficult to define the word Media in brief.

Before the advent of the digital age, the most popular forms of media were what we now call analog or traditional media: radio, newspapers, magazines, billboards, journals, and the like. Since then, the technological

revolution has brought with it many new types of media that now play a major role in disseminating information and entertainment to populations around the world. But what is digital media? What does it encompass, how did it evolve, and where is it headed?

Unlike traditional media, digital media is transmitted as digital data, which at its simplest, involves digital cables or satellites sending binary signals (0s and 1s) to devices that translate them into audio, video, graphics, text, and more. Anytime you use your computer, tablet, or cell phone, opening web-based systems and apps, you're consuming digital media. Digital media might come in the form of videos, articles, advertisements, music, podcasts, audiobooks, virtual reality, or digital art.

The digital age began to unfold in the second half of the 20th century, as computer technology slowly infiltrated different industries and then moved into the public sphere. Yet analogue technology remained dominant even through the 1990s. In the years that followed, newspapers, magazines, radio, and broadcast television were still the primary means of communication, with fax machines and pagers becoming most people's first casual forays into the digital world.

Before they go to sleep, they might talk to their digital home assistant, finding out the weather forecast for the following day. What is digital media? The answer is not a simple one. Defining digital media is difficult because it is rapidly evolving alongside innovations in technology and how people interact with it. As we move into the future, our day-to-day use of digital media will likely only increase, particularly as holographic and artificial intelligence (AI) technologies are developed and incorporated into our daily lives.

The digital era, however, meant a whole new set of media transmission methods and devices, with more developed every year. These days, most types of digital media fit into one of these main subgroups:

- **Audio:** Audio forms of digital media include digital radio stations, podcasts, and audiobooks. Tens of millions of Americans subscribe to digital radio services such as Apple Music, Spotify, Tidal, Pandora, and Sirius, which provide a wide range of musical stations and allow users to listen to databases of millions of songs on demand.
- **Video:** Many digital media outlets are visual, from streaming movie and television services such as Netflix to virtual reality surgical simulators used in medical institutions. One of the biggest players in visual digital media is YouTube, which hosts billions of videos. Launched in 2005, the website is one of the most popular destinations on the web.
- **Social Media:** social media includes sites such as Twitter, Facebook, Instagram, LinkedIn, and Snapchat, which enable their users to interact with one another through text posts, photographs, and videos, leaving "likes" and comments to create conversations around pop culture, sports, news, politics, and the daily events of users' lives.
- **Advertising:** Advertisers have made their way into the digital media landscape, taking advantage of marketing partnerships and advertising space wherever possible. The internet has moved away from the use of pop-up and auto play ads, which flooded early websites and drove away visitors. Instead, advertisers look toward native content and other methods of keeping consumers invested without overselling their product.
- **News, Literature, and More:** Traditionally, people consumed text via books, print newspapers, magazines, etc. The proliferation of literary websites, the popularity of resources like Wikipedia, and the rise of e-readers like the Kindle, all further underline the continued importance of written work in digital media.

In short

A) New Age Media has leveraged all the above **potentials of Conventional Media Power** to its fullest Extent.

B) New Age Media has replaced the **Conventional Media** to a great extent and created endless

Opportunities to catch the Audience at right place and time – Innovative media/Ambient Media is a Result of the same.

C) New Age Media has explored the immense power of **Visual in Communication** because of Science And Technology.

D) Digital Platform is a driving force behind the New Lifestyle and has given the birth to all **social media**.

E) Artificial Intelligence is a Game changer. **Virtual and Augmented Reality** will remain no more State-of-the-Art. it is going to be a part of daily life.

F) This is the world of **APPs**. New media is becoming more **Customer centric**. Offers you an opportunity to be Citizen Journalist. The changing Socio-economics created the need for the Conceptualization of APPs.

### Chapter 3) How Does New Age Media Overpower the Modern Communication?

(And Has Become New Creative?)

With the impact of Science and Technology New Media has emerged. And with the changing times, the conventional media has been being replaced with new age media.

New Media Forms:

Internet based media, social media, ambient and innovative media, Virtual Reality up to Augmented Reality.

It's observed that while pursuing the '**Quality of life**' with technology, the **new media is overpowering the lifestyle**.

This is a perfect example of “**How Medium has become new Creative**.”



The example is self-explanatory.

A 43-year-old Spanish school teacher, Veronica Duque wore a bodysuit depicting human anatomy for her students to teach them about the subject.

Knowing how hard, it is for kids to learn the internal body structure, it was the great innovative idea the teacher applied.

It was the same knowledge but the teacher applied innovative medium (Bodysuit) while teaching than the conventional way of teaching through text-book.

It helped students to understand the same subject quicker and better.

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The following table clearly up fronts the superiority of New Age Media over Conventional one.

The new Age Media bears the greater responsibilities, with the wider scope.

(The following table substantiates the point)

<p>Traditional Media is one to many.</p> <p>The focus is on news and information.</p> <p>Interactivity is negligible.</p> <p>Works in only one format.</p>	<p>Social Media is many to many.</p> <p>The focus is interaction among communities/brands.</p> <p>Interactivity is high. Members can comment / share posts.</p> <p>It is truly convergent. You can post text, audio, video, images, multimedia.</p>
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A) New Media has truly changed the face of Conventional News Paper.

Today's on-line paper offers the interactivity. Gives the readers opportunities to send feedback.

It even presents the responses of others.



B) Innovative/Ambient media is the most cost-effective way to reach out the desired audience



C) Medium defines the scope of a Visual. And New Media leverages the potentials of Visual Communication to its fullest extent with Science and Technology.

It's a universal truth that **Visuals have greater impact on audience than words.**

Communication involves all 5 sense organs.

Eyes: seeing, Ears: listening, Nose: smelling, Tongue: tasting and Skin: touching

But the impact of visual communication is above 80% amongst all.

Science presents the breakup as per following:

10% of what they hear

20% of what they read

80% of what they see and do

Visual communication is most powerful amongst all sensory organs.

(That's why **a picture is worth a thousand words.**)

Even, in our day-to-day life we experience the following things:

**Packaging** has brought in a Revolution.

**Visual merchandising** opens up newer vista for Consumer engagement.

**Information Design** opens up new career opportunities.

This is an amazing example of the power of the Visual in media.

(Headlines in newspaper when supported by pictures, not only completes the story but also makes The communication effective.)

Pictures make the news more authentic and alive.



**Figure No 1**



**Figure No 2.**

-Visuals don't leave ambiguity in information. (a picture of a sunrise means the same to all regardless The time and place)

-A car cannot be sold without a picture. Mixer cannot be sold without a demonstration.

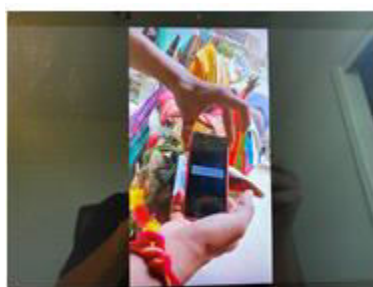
-Visual has instant effect as compared with text.

(Product demonstration helps salesman to sale products more effectively.)

-Safety instructions, demonstrated by airhostess on board, along with pre-recorded soundtrack becomes more communicative.

**Hence, Never the Less to Say That Medium Defines the Scope of A Visual.**

**D)** Internet and Digital Platform gave the birth to social media which has changed the way people Live



SEUM9688.MP4

**E)** Artificial Intelligence taking us in to the new world of Virtual Reality and Augmented Reality.



**F)** APPs are the part of new life-style? Download the APPs and bring in the comfort and convenience in your Day-To-Day life. It also offers you an opportunity to be Citizen Journalist.

The changing Socio-economics created the need for the Conceptualization of APPs which is one more avenues for media to be Creative.



### **Weather Telecast app**

Earlier we use to depend to TV news or radio to make an announcement now weather telecast app is showing detail scenario that in which part of city it is going to rain heavily along with small animation.

- **M Indicator App**

Once upon a time travelling was bit difficult. We have to really find out proper information for commuting one place to another from all the resources. for catching the taxi, or auto we use to make the arrangement earlier. Traveling was little tedious. But now on one click we get all the information about all the vehicles right from ST buses stand, trains, ricksha, metro stations, mono rail and so on.

M indicator gives time location, root on one click.

- **Calendar App:**

In olden days we use to hang calendar for getting information about festivals important dates

Along with other info housewife use to mark their daily expenses (they have converted their calendar as daily dairy.)

Now on one click we can open any calendar app end scroll the pages to see the information and other allied things.

- **Swingy and Zomato:**

Before 1 decade we use to get the parcel from the hotel but after development of technology

- **Ola Uber App:**

Few years ago, we have to go to auto stop or taxi stand for commuting from one place to another. After ola and uber services we can book our car according to lodge and no of people who are going to travel by car. you also get confirmation about the payment in prior. We can find out our own location and map .

- **Photo Album:**

In olden days we use to store our photos in different albums according to subject and theme in short, we use to make a classification of photos. those days we have to keep separate drawer only for photo albums. Now thousands of photos we can store in a photo gallery. With different names without wasting space of cupboard.

- **OLX.Com**

If you wanted to sell or buy the second-hand furniture or any electronic gazette or any other object you can find out your second-hand seller or buyer after uploading a photo on OLX.Com

- **Calculator**

We had never given a thought of that on one click we can make a calculation. earlier it took hours to make calculation manually. But science and technology has made it possible.

- **Note Pad**

Gone are the days where we use to spend the money on 100 or 200 pages note book to register our thoughts but with the help of notepad, we have made it possible to write in digital dairy.

- **Instagram App**

It allows you to create and share your photos and stories and videos with friends.

Instagram story' are creating 24 hours update. Now you can buy the seamless things on Instagram. Hence all young and also adults are showing.

- **Be Hance App**

Be hance is the leading online platform to showcase and discover creative work. The creative world updates their work in one place to broadcast it widely and efficiently.

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- **Koo App**

Koo App enables Indians to express themselves in Indian languages. Express on

Using Audio, Video or Text

- Baijiu app has taken a leap in learning and teaching process while taking a help of graphics and animation for every small thing.

Maths was never interesting, science was very complicating, history was very difficult without showing the battles, and geography was not so easy without showering rain ☔ and showing clouds and small weather icons in map (animations)

- Spotify / grana .com:

In olden days we used to listen the music in mass. but after science and technological development Music has become personalised. According to taste of the person we can choose the singer and music director and enjoy the Music.

Apart from that, digital media's impact has been worthy to take note of. It has not only provided a new dimension to our lifestyle but has also led to the development of communication skills, and worldwide accessibility.

Digital media has also provided a thousand more ways of entertainment and recreation.

So, the good rule of thumb is keeping a healthy balance between real and virtual life, we need to learn, how to use it effectively instead of getting used by it.

It has become the part of the life of Commons.

Just to illustrate one example:

With Internet and GPS technology, we all are constantly under watch. Whether you like it or not.

Kind of stuff you search on Google, you are being tracked through cookies and the relevant Ads are programmed for your exposure.

One incidence in US is very apt to share here.

An Indian father of a young woman received the promotional literature at home through Direct mail. It was all about the pills, stopping the pregnancy. Father wondered. Later on, it was discovered that Camera captured the woman in a Concerned Pharma section of a mall, handling the product. The Information was analyzed by 'AI' with deep logarithm and the promotional literature was delivered to home as prospective customer.

This is just one of the examples. Today, because of the penetration of IT at such a deeper level, an issue of privacy is also being discussed in the world.

Human life is literally revolving around a Mobile screen.

In the world of today, media has **become as necessary as food and clothing**. It has played significant role in strengthening the society. ... The purpose of the media is to inform people about current, new affairs and to talk about the latest gossip and fashion. It tells about the people who are geographically divided. from active participation and the generation of new attractive content from an individual.

### **Attention Span Has Become Smaller Than Before.**

How technology has changed our attention span?

“What we do find with technology like smartphones and tablets is that they have the tendency to **increase** our absent-mindedness, reduce our ability to think and remember, to pay attention to things and regulate emotion.

Instead of knowing the name of the festivals we all remember great Indian festival on amazon, we remember big bazar sale.

- Books have gone from clay tablet to papyrus to parchment and paper, from individual copies to mass production, and now they've been given a new life by appearing on a digital screen. And each step of the way they've been enriched.

Web utilities and digital readers and phones have only made the possibilities for them more interesting and the ability to access them more immediate.

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- **Tweeter**

Accounts are always helpful to create immediate impact on current affairs and issues first class female travellers are always making complaints about wrongly entering in other second-class females.

- **Amazon**

is an American multinational technology company which focuses on e-commerce, cloud computing, digital streaming, and artificial intelligence. It is one of the Big Five companies in the U.S

- **Books Kindal:**

Small icons and illustrations, and graphics are creating more interest while reading the story 'one- books. Besides to Websites there are pop up small ads of competitors showing the information. Which helps viewer to think about both the products.

Small stories can create the attention in webinar very susses fully.

- **The Benefits of OTT**

You reach many people. Viewers watch most ads almost to completion.

100% view ability. All advertisements run full screen meaning 100% of pixels are in view. ...

Brands safety with ads delivered on-demand, or during live TV, viewers are reached across reliable networks and popular content.

- Facebook sales are showcasing different products as theme. Bangla festival, Perl festivals, extra. Without commuting we can get to see current fashion trends. □□examples to place in research paper.
- Social media is an efficient tool to exercise consumer rights by sharing experiences about products and Services. But very few exercises it. The world has become smaller. A lost schoolmate is easily found on FB.
- LinkedIn opens new avenues for Professionals. We just need to leverage the power of social media responsibly.
- Changing face of creating awareness through these kinds of small animations are really interesting to spread the message.
- While traditional and new media can go hand-in-hand, there are a few reasons why we should consider adding new media to your mix over expanding your use of traditional media.
- In the context of present India, the ideal combination will 25% conventional media and 75 % Modern media.

Days are same as it the way we use to spend but mode of spending buying, selling, cooking things are change on daily activity. We live in an age of rapid technological changes. Every day we are flooded with information from everywhere. the new media does not rely merely on the written word for communication. Rather, it combines words with a lot of visual elements, including animation, cartoons etc.

In this new learning phenomenon, learning can be fun. We can play computer games and through games, puzzles and cartoons, also learn our history and maths lessons. This amazing combination of words with visuals and cartoons is known as new media. , all over the world people are realising that words alone cannot describe everything. That's why learning is better when words are combined with visuals, sound.

Books give us only words and illustrations, television gives us moving images and radio gives us sound. But what the internet gives us is a combination of all these.

New media is known for its ability to involve the audience. This is known as **interactivity**. Hence, we can say that compared to other media forms, new media has the most evolved feedback system in place.

Channels have a feedback system. Often, we see, after a program, the anchor advises the viewers to log on to their websites and post their opinions. You may be watching many realities shows on television, especially music and dance competitions. Audience feedback, in these shows, decides the fate of individual participants. The other special feature of new media is the use of multimedia. As mentioned, earlier, whenever stories are supported by cartoons, moving pictures, sound and

Music, it is called multimedia.

right from ordering the breakfast from swingy, reading online papers, shopping online dresses, buying electronic gazettes from amazon, selling the cars on app, chatting with friends on what s up, attending online seminars, dating on tinder, keeping the professionals updated on linked, a watching OTT platform, ordering

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diner from Zomato. And also booted the tickets online every small segment of human being has turn change from off-line to online

### **Power of new Media**

- **Communication/ Interaction**

New media trends to be much more interactive than traditional media, as well. New forms of media such as social media allow for direct communication and interaction between business and consumer. New media is often far less expensive than traditional media.

- **Feedback System**

New media is highly data driven. You have access to exactly how many eyeballs saw your banner ad, for example, or how many people visited your webpage.

- **Real-Time Results**

Unlike traditional media, the results you receive from new media are often in real-time. That allows you to make instant changes to your creative in order to achieve maximum effectiveness. It also gives new media a leg up over traditional, where it often takes time to see the results of a campaign.

- **Better Evaluation System**

An added bonus of new media is the accuracy of its results. Unlike with TV ratings, new media allows you to comb over results that show you exactly how many people saw your ad, how long they viewed your ad for, and whether or not it led to a click-through.

- **Global Reach**

New media has a global reach, whereas traditional media tends to be highly regional. With new media, you are able to reach the entire globe for a fraction of the cost.

- **Virility**

Truly effective new media has the potential to go viral. Your content could be shared with millions of people, boosting both your credibility and your image.

- **Ability to Track Results / Result Tracking**

When it comes to new media, the results are highly trackable. You can see exactly what demographics your ads are scoring big with, and which ones you're missing.

- **Mobility**

New media follows the consumer wherever they are.

- **Adaptability**

New media is adaptable. You can easily switch out the content and creative of an ad or create a new sponsored social media post.

- **Ease of Use**

The results are easy to understand, and the sites are easy to navigate.

- **Engagement**

New media allows for more engagement with consumers. new media opens the lines of communication between business and consumer.

- **Customization & Personalization**

New media can be easily customized to meet your business's needs.

- **Targeting Capabilities**

New media is excellent if you are trying to target specific individuals or demographics. The targeting capabilities go far beyond that of traditional media.

- **Run Multiple Campaigns at Once**

New media allows you to run campaigns with multiple different creative at the same time. This allows you to better target all demographics.

- **Amount of Usage**

In today's world, consumers simply interact more with new media than traditional media. People tend to spend an ever-increasing amount of time engaging with their cell phone, and less and less time watching TV or listening to the radio.

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- **Trust**

Having a presence on social media allows businesses to establish a sense of trust with consumers.

- **Choice of Audience**

New media is highly targeted, and just about everyone uses it. That means you can have your choice of audience.

- **Effect on Consumers**

New media can make consumers feel as if businesses and brands are accessible.

Strengths and weaknesses of this media Revolution:

**Strengths**

Web utilities and digital readers and phones have only made the possibilities for them more interesting and the ability to access them more immediate.

- Easy Access to Information.
- Encourages Innovation and Creativity.
- Improved Communication.
- The Convenience of Traveling/ Ease of Mobility.
- Improved Housing and Lifestyle.
- Improved Entertainment.
- Efficiency and Productivity.
- Encourages Innovation and Creativity.
- Improved Communication.
- Improved Entertainment.
- Efficiency and Productivity.

Any innovation is expected to better the human life. Not to bitter it. And so also the social media with a Digital platform.

**But the Media Revolution Has Its Flipside Also.**

Following picture is self-explanatory.



**Weaknesses of the Media Revolution**

- Not all web pages are reliable sources of information.
- Decreases Face-to-Face Communication Skills.
- Media include a risk of inaccurate reporting and a loss of privacy.
- Facilitates Laziness

**Attention Span has Become Smaller than Before.**

“What we do find with technology like smartphones and tablets is that they have the

Tendency **to increase** our absent-mindedness, reduce our ability to think and remember, to pay



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Attention to things and regulate emotion.

Instead of knowing the name of the festivals we all remember great Indian festival on amazon,

We remember big bazar sale.

- Cyber Crime rate will increase
- New Health issues will occur.

**Followings are some of the key observations of new socio-economic environment driven by digital platform.**

- **The Middle Class Gets Richer By Value and by Volume.**

This has increased the buying power. Life has been driven more by lifestyle than life-needs. 'Wants' have become 'needs.' The wristwatch is no more just a wrist watch but has become ornament. people use it more as a fashion statement. People have become more ambitious and less contented

- **Growing consumerism:**

Science and technology is presenting better products in terms of comfort and conveniences and market size is expanding with more competitive element. What used to be called a 'Developing economy' in the past now is catching up the speed to reach closer to developed economy. it is transforming into Buyer's market from Seller's market.

- **More Options in Career Building:**

As against the conventional options (Arts, Science and Commerce) education has become lucrative business. People have become extra cautious about the career building of their children. Old tread- skills have been replaced by new skill sets.

- Especially from Advertisers point of view **it's no more monologue.** It is the **dialogue** and that too not only between sellers and buyers but **amongst the customers also.** (E.g., Customers (Flat Buyers) form a group on 'WhatsApp' and question the builders about the delay in possession.)

**The Emergence of New Socio- Economy, Led By Science and Technology Has An Impact On Economic Reform.**

- New economic world order; Emergence of Cloud Technology. Few handful companies like Apple, Microsoft, Amazon, Google, FB will keep dominating the rest of the world with their knowledge and financial power.
- 5G Mobiles with all next upgraded versions will be connected with all Utility Electronics Gadgets at home and in office in cars and factories. This offers ultimate freedom to Individuals in life. Media and Technology must identify new Consumer Touch Points in tune with changing habits.

So far, Internet Communication has used interactive media. In future, it may develop technology to appeal to other senses of human beings: Eg. Smell, Taste and Feel of the products.

Any innovation is expected to better the human life. Not to bitter it. And so also the social media with a Digital platform.

**Once, we understand the complicated New Socio-Economic fabric, impacted by Science and Technology, then it becomes easier to understand the scope and limitations of New Age media in the context of Communication.**

**FINDINGS AND CONCLUSIONS:**

1. You can't stop the force of the development because it betters the quality of life. And we don't have option too but to move with new media to be tune with time.
2. We have to strike the golden point in its application. (Because it's like a sword with double age, or match stick. its utility value depends upon the user.)
3. Exploration of the new media has no end.

(Yesterday, Media worked on the 2 D and electronic form. Today it has become 3 D and 4 D. tomorrow it may involve all the five senses to make the communication most effective.) This is an Example of Virtual Reality.



Pooja will be performed on Digital platform.

Following is the example of Augmented Reality. An accentuated illusion of Reality.

Some of the examples through Augmented Reality

Following is the example of Augmented Reality. An accentuated illusion of Reality.



Tomorrow, this could be reality. Any surface could be a screen for projection.



**The Day is Not Far Away to Witness This.**

**Let's Strike The Golden Point.**

## HYDROQUINONE: RISK ASSESSMENT AND SAFETY IN COSMETICS

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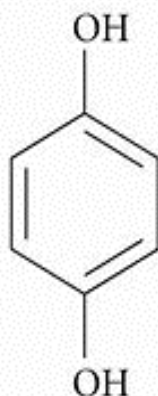
## ABSTRACT

1. Hydroquinone (HQ) has been used widely as a skin lightening agent in cosmetic industry but over the years many concerns was raised related to its safety. Chemically hydroquinone is known as 1,4-dihydroxybenzene.
2. The aim of this study is to find out risk and safety associated with use of hydroquinone in cosmetic industry.
3. Lately use of hydroquinone is banned because of arousal of concerns like leukomelanoderma en confetti and exogenous ochronosis. Hydroquinone is a skin bleaching agent.
4. There are some contraindications which need to be kept in mind while using hydroquinone (HQ).
5. Various risks associated with hydroquinone (HQ) are explained.
6. Other than side effects if used with safety and care it shows tremendous effects on skin and is used in various skin diseases.
7. Hydroquinone is topically applied agent that reduces the production of melanin which is responsible for colour.
8. Hydroquinone (HQ) is used for the treatment of melasma and hyperpigmentation. Various properties and risk associated with hydroquinone are elaborated. Case studies were studied about use of hydroquinone in treatment for various skin conditions like melasma, post- inflammatory hyperpigmentation.
9. Treatment is difficult and centred on lots of mechanisms to stop, hinder, and/or save you steps withinside the pigment production (melanocytic hyperactivity) process, breaking down deposited pigment for inner elimination or outside release, exfoliating cells to decorate turnover, and lowering inflammation.
10. For the effective treatment of hyperpigmentation, Hydroquinone (HQ) were loaded into solid lipid nanoparticles (SLNs) to get over the side effects of hydroquinone. The hot melt homogenization process was used to create the optimum SLN formulation, which was then completely characterised by different method.
11. Combination therapy was used to reduce side effects and increase efficiency, hydroquinone was used with various other components like kojic acid, glycolic acid, hyaluronic acid, tranexamic acid etc.
12. Topical lightening remedy in aggregate with solar safety is crucial for capacity improvement. The maximum normally prescribed and researched topical lightening marketers are hydroquinone (HQ)

**Keywords:** Hydroquinone (HQ), Mechanism, Risk, Uses, Melasma, Post inflammatory hyperpigmentation

## INTRODUCTION

Hydroquinone (HQ) is an aromatic compound, used extensively for skin lightening. It is also used as fragrance ingredient, antioxidant, hair colourant, reducing agent and skin bleaching agent.



**Figure 1:** Structure of Hydroquinone

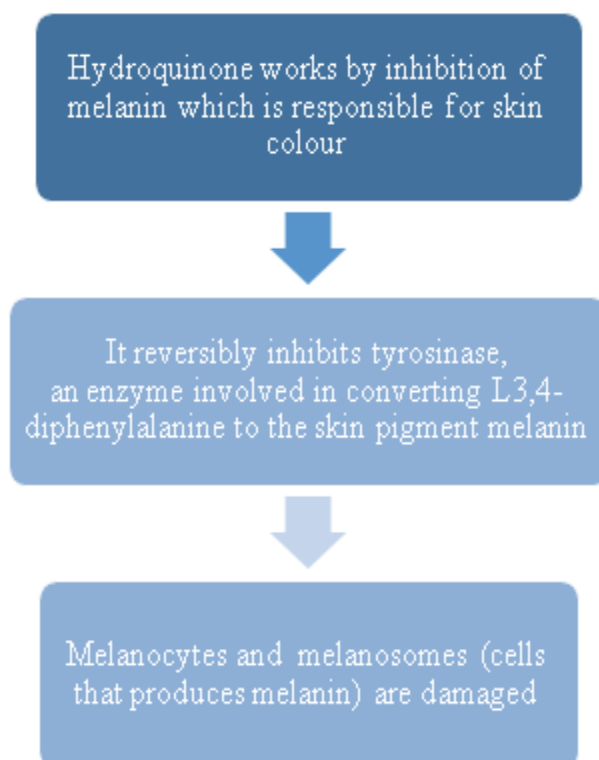
Chemically hydroquinone is known as 1,4-dihydroxybenzene. HQ is a crystalline solid that is colourless in its purest form. HQ is often prepared commercially as white to off-white crystalline crystals. Hydroquinone is also known as 1,4-Benzenediol 1,4-Dihydroxybenzene p-Dihydroxybenzene 4-Hydroxyphenol and p-Hydroxyphenol. The liquid portion of artificial nail systems contain hydroquinone, which works to prevent the polymerization of the methacrylate monomers. HQ was used 206 times in 1993, 151 times in 2007, and 32 times in 2009, according to data provided to the US Food and Drug Administration (FDA) as part of the Voluntary Cosmetic Registration Program (VCRP). [1]

Due to a lack of safety data, the European Union (EU) prohibited the use of HQ in hair dyes in 2008. They claim there is no proof that HQ, as it is present in hair colour products, is safe for human health. In the EU, only professional usage of hydroquinone in artificial nail systems is permitted, with a maximum concentration of 0.02 percent after mixing. It is quite challenging to create a stable formulation of hydroquinone. It is an extremely reactive oxidant that reacts with oxygen very quickly. Skin-lightening creams containing hydroquinone often have a creamy tint that turns darker as oxidation takes place. The hydroquinone loses some of its action as the discolouration intensifies. Products that have changed colour in any way should be thrown right away. In order to maximize the skin-lightening effectiveness of prescription hydroquinone formulations, penetration enhancers such glycolic acid or tretinoin have been used as an additional pigment-lightening agent. While some prescription formulations put the hydroquinone in a specific one-way airtight dispenser, others incorporated micro sponges to create timed administration of the drug to the skin. To combat UV-induced pigment darkening, several formulations include hydroquinone with sunscreen chemicals. [2]

#### A) Mechanism

Hydroquinone is widely used for skin lightening or in hyperpigmentation and the mechanism is based on:

Hydroquinone is topically applied agent that reduces the production of melanin which is responsible for colour. Tyrosine and phenol oxidases enzymatic oxidation are inhibited. By blocking the sulfhydryl groups, it prevents the synthesis of melanin and serves as a substrate for tyrosinase. At the tyrosinase active site, it interacts with copper and binds to histidine covalently. Additionally, it prevents the production of RNA and DNA and may change the way melanosomes develop, harming melanocytes only. These actions don't "bleach the skin," but rather progressively reduce the formation of melanin pigment. Telangiectasias and steroid-induced acne can develop after using topical steroid cream for more than 8 weeks. Patients can start using hydroquinone and tretinoin after 8 weeks. Tretinoin cream can be used every night if there isn't a recurrence after 12 months. Telangiectasias and steroid-induced acne can develop after using topical steroid cream for more than 8 weeks. Patients can start using hydroquinone and tretinoin after 8 weeks. Tretinoin cream can be used every night if there isn't a recurrence after 12 months. [3]



**Figure 2: Mechanism of Hydroquinone (HQ)**

**C) Physical and Chemical Properties of Hydroquinone****Table 1:** Physiochemical Properties of Hydroquinone [1]

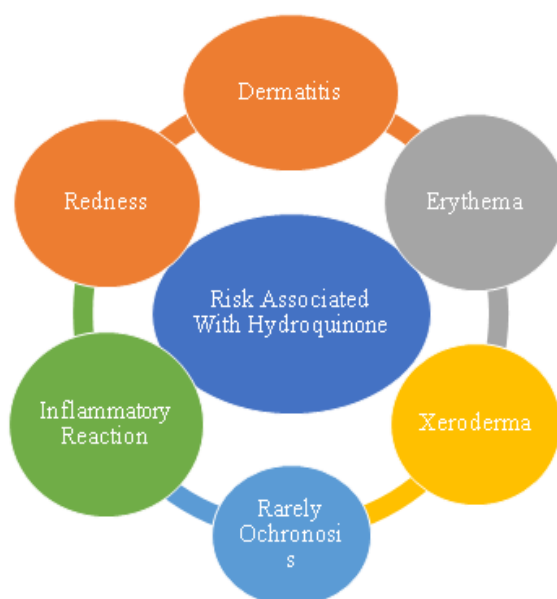
PROPERTY	VALUE
Chemical name	C <sub>6</sub> H <sub>6</sub> O <sub>2</sub>
Molecular weight	110.11
Vapor pressure @ 25 °C, Pa	$2.34 \times 10^{-3}$
Colour form	Colourless crystals
Melting point (°C)	72
Boiling point	285-287 @760 mm Hg
LogPow	2.34 $10^{-3}$

**D) Ideal dosage form usage for hydroquinone****Table 2:** Strengths of Hydroquinone Used in Different Dosage Forms

S. No	Dosage form	Strengths
1	Topical	2%, 4%
2	lotion	2%
3	Emulsion	4%
4	Topical solution	2%, 3%
5	Topical gel	2%, 4%

**E) Risk Associated with Use of Hydroquinone in Cosmetics**

- Short- term and long-term use of hydroquinone can cause exogenous ochronosis and leukoderma en confetti
- Hydroquinone only works on dermis layer but not on epidermis.
- Long term use of hydroquinone can cause nephrotoxicity and carcinogenicity.
- Irritation, redness, and contact dermatitis are other common side effects of hydroquinone.
- Use of hydroquinone should be avoided on dry and sensitive skin because it can lead to itchy and dry skin.
- Although topical hydroquinone has been used for 50 years without any recorded incidences of cancer in people, high dosage oral hydroquinone has been shown to cause cancer in rats.
- Long term use of hydroquinone can also cause epidermal thickening.
- Oral administration can cause convulsion and haemolytic anaemia.
- Hydroquinone cannot be used during pregnancy and lactation. [4,5]

**Figure 3:** Side Effects of Hydroquinone [6]

Risk associated with hydroquinone is determined by margin of exposure (MOE), it is carried out commonly on rats, 559 range is considered as safe for hydroquinone that can be used in formulations

Hydroquinone is also used in treatment of melasma. A concentration of 2-4 percent is utilized. When combined with other medicines, its efficacy is increased. These mixtures include the Kligman formula (5% HQ, 0.1 tretinoin, and 0.1 dexamethasone), the modified Kligman formula (4% HQ, 0.05 tretinoin, and 1% hydrocortisone acetate), the Pathak formula (2% HQ and 0.05-0.1 tretinoin), and the Westerhof formula (4.7 percent N-acetylcysteine, 2% HQ, and 0.1 percent tri [27] Melasma has also been treated with a combination of microencapsulated HQ 4 percent, retinol 0.15 percent, and antioxidants, with studies demonstrating improvements in disease severity, pigmentation intensity, lesion area, and colorimetry evaluations.

#### F) Uses of Hydroquinone (HQ)



Figure 4: Uses of Hydroquinone

#### G) Contraindication

- Allergic reaction or hypersensitivity hydroquinone
- Sun exposure
- Medication that causes photosensitivity require special caution when used with hydroquinone.
- Cannot be given during pregnancy and lactation.
- Avoid use of hydroquinone with peroxide products such as hydrogen peroxide and benzoyl peroxide because it can cause discolouration.
- Alpha hydroxy acids (AHA) cannot be used in combination with hydroquinone. [6]

#### H) Hydroquinone is used in Several Skin Conditions

##### Melasma

A frequent acquired pigmentary condition mostly affecting women is melasma. Typically, bilateral, and commonly symmetrical hypermelanosis, which affects sun-exposed parts including the upper lip, cheeks, forehead, and chin, is what distinguishes it. The gold standard for treating melasma, particularly the epidermal variety, HQ is the most commonly prescribed depigmenting agent in the world. HQ formulations are frequently administered once day to treat melasma at concentrations ranging from 2 to 5 percent. [7]

The cause of hydroquinone-induced hyperpigmentation in exogenous ochronosis is unknown, and recovery after avoiding the offending substance happens extremely slowly. It is never advisable to treat melasma with HQ monobenzy lether since doing so might result in a permanent loss of melanocytes and a disfiguring leukoderma that looks like confetti.

##### Several Case Studies Were Carried Out

A Middle Eastern woman, age 34, had hyperpigmented areas all over her face. A 2-month course of 4 percent HQ treatment has already been administered to the patient, with little to no improvement. Physical examination

revealed dark hyperpigmented areas over the cheeks on the patient. Her melasma was primarily of the epidermal kind, according to Wood's cursory assessment. She began with daily applications of topical MMI at 5 percent and BHT at 0.04 percent. After 8 weeks, the lesions cleared up almost entirely. There was no discernible difference in the TSH levels before and after the therapy. [8, 9]

**Debabrata Bandyopadhyay et al.** Carried out study it was investigated that (, when face hyperpigmentation was evaluated at the end of the fourth week of therapy, it reacted more quickly to 4% Hydroquinone cream than to 0.75 percent Kojic Acid cream. After a 12-week treatment period, 4 percent Hydroquinone cream outperformed 0.75 percent Kojic Acid cream in terms of overall effectiveness as a topical hypo pigmenting agent. In comparison to 0.75 percent Kojic Acid cream, the study's findings demonstrate that 4 percent Hydroquinone cream is a more effective topical hypo pigmenting agent with a quicker rate of clinical improvement. [10, 11]

#### Marketed Products

1. Admire My Skin 2% Hydroquinone Dark Spot Corrector
2. Paula's Choice Triple-Action Dark Spot Eraser
3. Melloderm Anti-Melasma Hydroquinone 2% Cream
4. PCA Skin Pigment Gel
5. Clinicians Complex 6% Skin Bleaching Cream
6. Murad Rapid Age Spot and Pigment Lightening Serum
7. Alpha Skin Care Dual Action Skin Lightener
8. MD Complete Professional Dermatologist Dark Spot Corrector and Melasma Cream for Face, Hands, And Body

#### Post-Inflammatory Hyperpigmentation

Skin inflammation leads to an increase in melanin synthesis, which leads to post inflammatory hyperpigmentation. Psoriasis, eczematous dermatoses, contact dermatitis, psoriasis vulgaris, lichen planus, and burns are common conditions that result in post inflammatory hyperpigmentation. The most frequent cause of hyperpigmentation is photodamage from exposure to sunshine. Arachidonic acid is released and oxidized more readily during an inflammation response, which promotes the synthesis of prostaglandins and leukotrienes and melanin. In addition to providing photoprotection, hydroquinone is utilized to treat post inflammatory hyperpigmentation. With hydroquinone, improvements take many weeks to months to manifest. [12, 13]

#### Solid Lipid Nanoparticles of Hydroquinone

High levels of drug encapsulation and long-term physicochemical stability were demonstrated by precirol-based SLN dispersions that included HQ. The XRD and DSC data demonstrated that HQ was disseminated in an amorphous condition in the SLN formulation. In comparison to HQ hydrogel, using HQ-loaded SLN formulation led to a larger amount of drug remaining and localizing in the skin and less drug entering into the receptor compartment. According to the findings, the produced HQ-loaded SLN demonstrated a viable method for treating hyperpigmentation on the skin. [14]

#### Combination Therapy

Combination therapy reduces the adverse effects of hydroquinone and increase its efficiency the "formula" developed by **Kligman and Willis**, which included hydroquinone 5 percent, tretinoin 0.1 percent, and dexamethasone 0.1 percent, was shown to be more successful than each of the three therapies when administered separately. In more than 50% of patients, TCC maintenance therapy with the same treatment over 6 months on a tapering schedule (three times weekly for the first month, twice weekly for the second month, and once weekly for the fourth month) could prevent relapse. The retinoid helps prevent the oxidation of hydroquinone. [15]

In another research, the same TCC was administered to 70 melasma patients for 24 weeks. Patients who used the cream sporadically or consistently for up to 24 weeks for moderate to severe melasma reported minimal or minor adverse effects, such as erythema, scaling, burning, or telangiectasia. In their 24-week research of 62 melasma patients using the same TCC daily, Bhawan and colleagues provided confirmation for these findings. They noted a very minimal risk of skin atrophy with this treatment and a significant decrease in epidermal melanin in those treated. [16]



Hydroquinone (HQ), a structural analogue of melanin precursors that prevents tyrosinase from converting L-3,4-dihydroxyphenylalanine (L-DOPA) to melanin, is the most well-researched and often used topical depigmenting agent. Irritation, allergic contact dermatitis, and ochronosis are unusual adverse cutaneous consequences. The depigmenting effect is enhanced when a retinoid and a corticosteroid are combined, according to numerous research. 3,11-13 The most popular formulation is a triple combination cream called Tri-Luma®, which contains HQ 4 percent, fluocinolone acetonide 0.01 percent, and tretinoin 0.05 percent. However, several compounded variations are now utilized in clinical settings. It is advised that doctors only administer HQ products for a continuous period of 3-6 months to avoid long-term side effects like ochronosis. 14 However, combining long-term "weekend only" or "three times weekly" therapy with short-term continuous therapy. [17, 18, 19]

**Zohreh Tehranchinia et al.** carried out clinical study to evaluate the therapeutic efficacy and safety of tranexamic acid local infiltration in combination with topical 4% hydroquinone cream compared to topical 4% hydroquinone cream alone in patients with melasma and concluded that the effectiveness of topical treatment can be increased by combining tranexamic acid injections with traditional hydroquinone therapy. Combining these two treatment plans led to a significant and statistically significant improvement in MASI scores in their trial, with fewer adverse effects. As a result, it might be useful in the treatment of all melasma cases, particularly those that are resistant. [20]

**Zeinab a Ibrahim et al.** evaluated the safety and efficacy of combinations of hydroquinone, glycolic acid, and hyaluronic acid in the treatment of melasma. They included One hundred patients with mild, moderate-to-severe melasma were divided into five groups. Each group was given different formulations. Group 1 was administered with (20 patients) with cream formula containing 4% hydroquinone, group 2 (20 patients) was administered with cream formula containing 4% hydroquinone + 10% glycolic acid, group 3 (20 patients) was administered with cream formula containing 4% hydroquinone + 0.01% hyaluronic acid, group 4 (20 patients) was administered with cream formula containing 4% hydroquinone + 10% glycolic acid + 0.01% hyaluronic acid and group 5 (20 patients) was administered with placebo cream and it was reported that group 2 showed more side effects followed up by group 4, group 1 and group 3. Treatment of melasma with a cream composition containing 4 percent hydroquinone, 10 percent glycolic acid, and 0.01 percent hyaluronic acid was very successful with manageable side effects. The dermoscope is an important non- invasive tool for melasma diagnosis and treatment monitoring. [21, 22]

## CONCLUSION

Hydroquinone (HQ) is an effective topical whitening agent, very secure profile but there are also many risks associated with it along with benefits as discussed. Hydroquinone is widely used as skin whitening agent and in treatment of various skin conditions like melasma, post- inflammatory hyperpigmentation, psoriasis etc. Hydroquinone is still the most effective Previously discovered pigment brighteners, but There is no clean security profile. Subject to controversy. Not exactly known How the FDA decides about the future Hydroquinone. Hydroquinone is safe to use Method under the guidance of a dermatologist. Risk and safety associated with use hydroquinone is elaborated. Hydroquinone is delivered is also delivered as solid lipid nanoparticle for better penetration across the skin. Also, it is used in combination therapy, some case studies by authors are explained. Hydroquinone can be used in specified quantity with minimized side effects and better effects.

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**UTILIZATION OF NATURAL INGREDIENTS MORINGA TO INCREASE IMMUNITY AS  
IMUNOMODULATOR**

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**Retno Widayani<sup>1\*</sup> and Rianty Aryani Putri<sup>2</sup>**<sup>1</sup>University of Muhammadiyah Cirebon, West Java, Indonesia- 45611<sup>2</sup>Autoimuncare Indonesia, Cirebon, West Java, Indonesia- 45135**ABSTRACT**

*Moringa is a plant that grows around the house and has various functions in maintaining public health in Indonesia. Moringa is used both for humans, livestock, shrimp and fish. Its use is in various forms such as drinks, food mixes, vegetables, snacks, for bathing, as creams, as masks, and injected. This study was conducted to determine the benefits of Moringa in fish, in shrimp, in mice, and in humans as an immunomodulator. The benefits of Moringa in humans are in the form of tea drinks, snacks, food, skincare masks, body lotions and creams as well as Morricecare® herbal medicine. The method used in this study is a literature study of various research results that have been published in journals and making a Morricecare® herbal drug formula followed by laboratory tests so that the distribution permit can be further processed by the Indonesian Food and Drug Administration. The results of this study indicate that Moringa can be used to increase immunity for shrimp by adding Moringa extract, while fish immunity is also increased by injection of Moringa extract. Immune enhancement in humans is consumed in the form of tea, snacks, vegetables, food and skincare (creams, lotions and masks) and the herbal medicine Morricecare® has been successfully formulated as an immunomodulator for human health. During the COVID-19 pandemic, early 2020 to 2021, by consuming Morricecare® 3 times a day, you can recover from COVID-19 symptoms within 1 week. This proves that Moringa is effective as an immunomodulator agent.*

**Keywords:** *Moringa, Fish, Shrimp, Human, Immunomodulator, Covid 19*

**INTRODUCTION**

Moringa is a plant that can grow quickly, live long, flower all year round, and withstand extreme heat conditions. This plant is native to tropical and subtropical regions of South Asia. Moringa plants are also known as efficacious medicinal plants that can be utilized by all parts of the plant, from the leaves, bark, seeds, to the roots. The use of Moringa as a natural herbal remedy that has been claimed by many cultures is slowly being confirmed by science. Moringa has antioxidant compounds such as flavonoids, ascorbic acid, carotenoids and phenolics. During a pandemic like now, eating vegetables Moringa to improve immunity Moringa contains many nutrients that are very beneficial for the body. Clinically, Moringa has never been tested to ward off Covid-19. However, Moringa can increase the body's immune system and with a good immune system, viruses or diseases will not easily attack the body quickly. The content of Moringa leaves has long been known for its goodness because Moringa leaves are one of the superfoods. Superfood itself is a functional food that is highly nutritious and rich in phytochemicals that are beneficial for the body and immunity, especially during a pandemic (Britany and Sumarni, 2020).

The World Health Organization (WHO) has introduced Moringa leaves as an alternative food to overcome nutritional problems (malnutrition). In Africa and Asia, Moringa leaves are recommended as a nutrient-rich supplement for nursing mothers and growing children. All parts of the Moringa plant have nutritional value, are efficacious for health and benefits in the industrial sector (Aminah et al, 2015 cited by Samsudrajat et al, 2022). Moringa plant is a plant that has content to increase body immunity. The use of moringa as a natural herbal remedy that has been claimed by many cultures and communities based on real life experiences is now slowly being confirmed by science. Substances contained in Moringa leaves work as an effective source of natural antioxidants. Moringa leaves also contain a number of amino acids. The amino acids contained in Moringa leaves are thought to be able to boost the immune system. Consuming Moringa leaves also helps the development of the body and is an ingredient in traditional medicine to treat various diseases. During a pandemic like now, eating vegetables and fruits that have lots of high antioxidant substances can increase the body's immunity so that it can ward off viruses and diseases (Samsudrajat, 2022).

According to research results, Moringa leaves contain a variety of important nutrients needed by the body, including vitamin C, vitamin B, calcium, potassium, iron, and protein in very high amounts. The nutritional content contained in Moringa leaves is also very easily digested by the human body. Dried Moringa leaf powder contains 10 times more vitamin A than carrots, 4 times more vitamin B1 than meat, 50 times more vitamin B2 than sardines, 50 times more vitamin B3 than nuts, 4 times more vitamin E than oil corn, beta carotene more than carrots, 25 times more iron than spinach, 6 times more zinc than almonds, 15 times more potassium than

bananas, 17 times more calcium than milk, 9 times more protein than yogurt, and 6 times more amino acids than garlic (Kurniasih, 2013 cited from Hardiyanthi, 2015). Moringa leaves contain a number of amino acids. The amino acids contained in Moringa leaves are thought to be able to boost the immune system. Amino acids in the body will undergo protein biosynthesis. Of the 20 types of amino acids, 19 -L-amino acids and one L-imino acid can be synthesized into more than 50,000 proteins which together with enzymes play a role in controlling the chemical activity of antibodies to prevent various diseases (Hardiyanthi, 2015).

The use of Moringa leaves as a natural herbal remedy that has been claimed by many cultures and communities based on real life experiences is now slowly being confirmed by science. Substances contained in Moringa leaves work as an effective source of natural antioxidants. This is due to the presence of several kinds of antioxidant compounds such as flavonoids, ascorbic acid, carotenoids and phenolics contained in Moringa leaves. Moringa is one of the plants that contains many important nutrients, especially in high amounts in only one plant. However, Moringa itself is reported to have a different nutritional content higher than that found individually in several types of foods and vegetables. Moringa leaf water extract contains active compounds of alkaloids, saponins, tannins, phenols, flavonoids, triterpenoids, steroids, and glycosides (Pradana, 2019 cited from Britany and Sumarni, 2020). Antioxidants can fight the harmful effects of free radicals or Reactive Oxygen Species (ROS) which are formed as a result of oxidative metabolism, which is the result of chemical reactions and metabolic processes that occur in the body. Consuming Moringa leaves also helps the development of the body and is an ingredient in traditional medicine to treat various diseases. During a pandemic like now, consuming vegetables and fruits that have lots of high antioxidant substances can increase the body's immunity so that it can ward off viruses and diseases. The purpose of this activity is to provide information to the people of Bancuh Village about the benefits of Moringa leaves in increasing immunity during the pandemic and the products that can be produced from processing Moringa leaves (Britany and Sumarni, 2020).

The nutrients possessed by Moringa leaves make the benefits of this plant always in demand by herbal lovers. Not only that, Moringa leaves can also boost the immune system to prevent or anticipate the Covid-19 virus. Moringa leaves are plants that have various benefits that are good for the body, the content of antioxidants and amino acids in Moringa leaves not only increases endurance, but can repair any damage that can be caused by viruses.

1. Antioxidant agents Moringa leaves have antioxidant properties that can protect the body from free radical attacks. The high antioxidant properties are able to increase the body's resistance so that it is able to ward off various diseases, such as the covid-19 virus as it is today.
2. Antibacterial agent apart from having antioxidant properties, 27 Moringa leaves also have antibacterial properties. The antibacterial properties present in Moringa leaves are able to inhibit the development of harmful microorganisms in the body. Microorganisms that develop in the body are able to damage tissues in the body and cause various health problems.
3. Overcoming inflammation consuming Moringa leaves can relieve inflammation in the body. The content of isothiocyanates which act as anti-inflammatory substances.
4. Improve the immune system besides being useful for dealing with stress, the amino acid content in Moringa leaves also plays an important role in maintaining the body's digestive system. The nutritional content in Moringa leaves functions effectively to repair any damage to body tissues and growth processes. Regularly consuming Moringa leaves, we will have a strong immune system and avoid the risk of contracting various diseases, including to prevent or anticipate the covid-19 virus.

Moringa oleifera is a magical plant that has a high nutritional content. Moringa leaves are the most popular among the public because they are easy to process and can be eaten either directly or processed into flour. The purpose of this scientific work is to provide information to the public regarding the use of Moringa leaf flour which is beneficial for the immune system. The method applied is the literature study method. Some levels of nutrients in Moringa leaves in the form of flour have the potential to be an immunomodulator in improving the immune system from damage caused by pathogenic microorganisms. The use of Moringa leaf flour is not only traditional but also in a modern way, namely by processing Moringa leaf flour into various products such as cookies, noodles, ice cream, chocolate and so on to increase public interest. Consuming food products that contain good nutrition can improve and facilitate the work of the immune system in recognizing abnormal cells that try to enter and damage the body (Nepa and Novia, 2020).

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## RESEARCH METHODS

The method used in this study is a literature study of various research results that have been published in journals and making a Morricecare® herbal drug formula followed by laboratory tests so that the distribution permit can be further processed by the Indonesian Food and Drug Administration. The literature used is in the form of theses, research journals, community service journals and reports on community service activities. Morricecare® formulation uses Moringa extract and ant nests obtained from certified suppliers. Then laboratory tests were carried out which included Shigella bacteria test, heavy metal contamination test, and microbiological contamination test. Laboratory testing is carried out at PT Vicma Lab Indonesia, a traditional medicine and food testing laboratory in Bogor, Indonesia. Formulation is carried out at PT Autoimuncare Indonesia, Cirebon, West Java, Indonesia.

## DISCUSSION

### Moringa Activity as an Immunomodulator

The body's need for adequate immunity is one of the most important factors in the current Covid-19 pandemic. There were 136,291,755 confirmed cases of Covid-19 (April 2021) with 2,941,128 deaths in 223 countries around the world, while in Indonesia there were 1,577,526 confirmed cases, 42,782 deaths (2.7%). One of the preventive measures is the need for additional immunomodulatory ingredients from herbal ingredients, namely Moringa leaves (*Moringa oleifera* Lam.). Five articles from 2013-2019 about Moringa leaf activity as an immunomodulator published in national indexed journals (Sinta) and international indexed journals (Scopus) evaluated by (Legifani, 2021). Moringa leaf extract has activity as an immunostimulant based on the parameters of B and T lymphocytes (dose 14 mg/kgbw - 84 mg/kgbw), CD4+ & CD8+ cells (dose 14 mg/kgbw), CD4+ IFN- $\gamma$  + and TNF- $\alpha$  + (42 mg/kgbw), leukocyte cells (100 mg/kgbw). Activity as an immunosuppressant based on parameters of B and T lymphocytes (dose 14 mg/kgbw - 125 mg/kgbw), CD4+ & CD8+ cells (84 mg/kgbw), CD4+ IFN- $\gamma$  + and TNF- $\alpha$  + (84 mg / kgbw), leukocyte cells (10 mg/kgbw – 30 mg/kgbw). Can be concluded that Moringa leaf extract (*Moringa oleifera* Lam.) has immunomodulatory activity (immunostimulant and immunosuppressant) based on in vivo testing with a dose range of 10 – 125 mg/kgbw.

The other experiment (Fathir et al, 2014) Typhoid fever is caused by *Salmonella typhi* infection, and is still a problem in developing countries, including Indonesia. Typhoid fever occurs due to the body's immune system, especially CD4+ T cells and CD8+ T cells, which are deficient, so that *S. typhi* can infect body cells. This study aims to determine whether the administration of Moringa leaf extract can increase the number of CD4+ T cells and CD8+ T cells in mice infected with *S. typhi*. This study used a completely randomized design with a factorial pattern. Mice were divided into two groups, namely the non-infected group (given Moringa leaf extract at a dose of 14 mg/kg BW, 42 mg/kg BW and 84 mg/kg BW) and mice infected with *S. typhi* (given Moringa leaf extract at a dose of 14 mg/kg). BW, 42 mg/kg BW and 84 mg/kg BW). The results showed that administration of Moringa leaf extract could increase the number of CD4+ T cells and CD8+ T cells in all groups of mice and administration of high doses of Moringa leaf extract caused immunosuppression. Moringa leaf extract can function as an immunostimulant and immunosuppression on CD4+ T cells and CD8+ T cells of mice.

Moringa leaves (*Moringa oleifera* L.) are known to contain chemical compounds that have been used by the community to overcome various health problems, one of which is the activity of the leaves as an immunomodulator. This study aims to determine the immunomodulatory effect of Moringa leaf extract using the carbon clearance method to measure the activity of phagocytic cells in killing pathogenic organisms that enter the body and calculate the total leukocyte cell count. The test parameters used were phagocytosis index and total leukocyte count. The research method was twenty male white mice divided into 4 groups. Mice in group I (carrier control) were given 0.5% Na-CMC, groups II, III and IV were given Moringa leaf extract at doses of 10, 30 and 100 mg/kgBW orally for six consecutive days. On the seventh day, male white mice were given carbon suspension intravenously in the mice's tail. Phagocytosis index value (IF) > 1 has activity as an immunostimulant. Data were analyzed using one-way ANOVA and Duncan's advanced test. The results of data analysis using one-way ANOVA showed that the test dose group was significantly different from the carrier control group (NaCMC 0.5%) ie ( $P < 0.05$ ). Increasing the dose of Moringa leaf extract is effective in increasing the immunomodulatory effect, so it can be concluded that Moringa leaf extract has an immunomodulatory effect, namely immunostimulants (Fakhri, 2017).

### Moringa as an Immunomodulator in Shrimp

Vannamei shrimp is an organism that only has a non-specific immune system to defend itself from pathogens that cause Vannamei shrimp to be more susceptible to disease. Thus we need a way to increase shrimp immunity so that shrimp production can continue to be increased. One of the efforts in controlling and

preventing shrimp disease is through increasing the body's defense system in shrimp by giving immunostimulants, vitamins and hormones (Johny et al., 2005 cited by Pratama et al., 2018). Immunostimulant is a substance that is often used to improve the immune system of shrimp, by giving microbial components such as -glucan and lipopolysaccharide (LPS) or bacterial cells that have been killed (Smith et al., 2003). Immunostimulants are directly related to immune system cells that make these cells more active. The weakness of immunostimulants like this is that they are relatively expensive, so it is necessary to find alternative sources of immunostimulants that are cheap and easy to handle, one of which is Moringa leaf extract. Moringa (*Moringa oleifera* Lam) is a type of plant from the Moringaceae tribe. This plant contains flavonoid compounds, alkaloids, phenols, and saponins (Arora et al., 2013 cited Pratama et al., 2018). Alkaloids in Moringa leaves act as antibacterial and are able to stop free radical chain reactions (Bamishaiye et al., 2011 cited Pratama et al., 2018). The results of another study showed that administration of Moringa leaf extract in addition to increasing the number of CD4+ T cells was also shown to increase the relative number of CD8+ T cells (Fathir et al., 2014 cited Pratama et al., 2018) and had a role as an immunostimulant because it could increase macrophage activity (Biswas et al., 2012 cited Pratama et al., 2018).

(Pratama et al., 2018) study applied an immunostimulant in the form of Moringa leaf extract (*Moringa oleifera* Lam) by immersing it on 10 gram vannamei shrimp in 10 liters of water for each treatment. Treatment A (0 mg/L Moringa leaf extract), B (20 mg/L Moringa leaf extract), C (30 mg/L Moringa leaf extract), and D (40 mg/L Moringa leaf extract). Maintenance for 16 days with a frequency of feeding 4 times a day at 07.00; 12.00; 17.00; and 22.00 WIB, with sampling on days 0, 4, 8, 12, and 16. This indicated that soaking with Moringa leaf extract was able to increase total haemocytes in vannamei shrimp. The increase in THC value from day 0 to 16 was due to the administration of Moringa leaf extract which played a role in increasing the immune system in vannamei shrimp. The alkaloid content in Moringa leaves can increase the number of haemocytes in living organisms Moringa leaf extract had a significant effect on the phagocytosis index of vannamei shrimp. The highest increase in phagocytosis index was obtained in treatment D with a value of 0.53. Phagocytosis and its index show how much the shrimp's immune system reacts to microorganisms that infect its body (Pratama, 2018). A high phagocytic index value illustrates that the organism has the ability to produce more phagocytic cells in haemocytes, so that when exposure to pathogenic microorganisms occurs, haemocyte cells are ready to perform phagocytosis.

#### **Moringa as an Immunomodulator in Nila Fish**

Subriyana et al., 2020 result of Sibuyan research indicated that non-specific immunities are the main defenses in the fish seed. One of the natural ingredients as a source of immunostimulants is *Moringa oleifera*. Moringa leaves contain flavonoids, alkaloids, terpenoids and saponins as immunostimulant agents. Immunostimulants are biological that can enhance the immune system. The purpose of this study was to determine the effect of Moringa leaf extract in increasing non-specific immunity in tilapia (*Oreochromis niloticus*) seeds infected by *Aeromonas hydrophila*. In giving Moringa leaf extract intramuscular injection of 0.1 mL/fish with concentrations of 50 mg, 75 mg, and 100 mg. In this research method, a completely randomized design (CRD) was used with 4 treatments and 3 replications, each aquarium containing 12 tilapia measuring 8-10 cm each. Feeding on tilapia is done every 3 times a day namely morning, afternoon, and evening. The parameters tested were leukocytes, differential leukocytes, erythrocytes, phagocytic activity, and index. The results showed that the administration of Moringa leaf's extract injected into tilapia seed can increase nonspecific immunity, which are total leukocytes, total erythrocytes, differential leukocytes, activity, and phagocytosis index. According to (Raa, 1992 cited by Subriyana et al., 2020) when immunostimulants enter the body of fish, it will stimulate macrophages to produce interleukins which will make lymphocyte cells divide into T-lymphocytes and B-lymphocytes and make B-lymphocytes become more active in producing antibodies. One of the natural ingredients that can be used as an immunostimulant is Moringa leaf (*Moringa oleifera*). Moringa leaves contain flavonoid compounds, alkaloids, phenols and saponins (Arora et al., 2013 cited by Subriyana et al., 2020). Giving Moringa leaf extract with a concentration of > 150 mg will result in loose fish fins and bleeding on the gills. Flavonoids have a role as antioxidants and are able to stop free radical chain reactions, while saponins function as immunostimulant agents.

#### **Moringa as an Immunomodulator in Tea Products**

Tea is one type of drink that is much favored by the people of Indonesia who make tea drinks as a refreshing drink as well as having benefits for the body. The benefits of drinking tea are that it gives a fresh taste, can restore body health and is proven to have no negative impact when consumed in reasonable doses. Tea can be made from other leaves such as Moringa leaves which will be made in this activity. Drying process is a way of removing or removing some of the water content contained in a material with heat energy so that the material is

not easily damaged when stored. Oven dried is a method of drying tea leaves using an oven (Somantri and Tantri, 2011 cited by Nganji et al., 2021).

Benefits of Moringa Dried Moringa leaves per 100 g contain 7.5% water, 205 g calories, 38.2 g carbohydrates, 27.1 g protein, 19.2 g fiber, 2.3 g fat, 2003 mg calcium, 368 mg magnesium, phosphorus 204 mg, copper 0.6 mg, iron 28.2 mg, sulfur 870 mg, potassium 1324 mg. The content of dried Moringa leaves weighing 100 grams contains two times higher protein than yogurt, seven times higher vitamin A than carrots, three times higher potassium than bananas, four times higher calcium than milk, and seven times higher vitamin C than oranges. Moringa leaves in tea making are very beneficial for health because they contain flavonoids as antioxidants and anti-inflammatory. Moringa is used in the treatment of ailments such as rheumatism, paralysis and epilepsy. In addition, extracts of the leaves, seeds and roots of the Moringa tree have been studied extensively and are analgetik.

How to make Moringa tea as follows: Prepare  $\pm$  500gr of Moringa leaves and then washed thoroughly and separated from the branches. After being washed thoroughly, then the leaves are drained and separated from the yellow leaves. The leaves that have been separated are then dried in the sun to dry, avoid drying in direct sunlight so that the nutrients are not lost. The dried leaves are then blended until small. Moringa is ready to be consumed. The weakness of this Moringa leaf tea is that it has an unpleasant taste. For this reason, to reduce the unpleasant taste of Moringa leaves, honey can be added as a sweetener as well as to disguise the unpleasant taste. Moringa leaf tea can be sold in the form of tea that is ready to drink with a shelf life of up to 1 month, or in powder form it can be stored for up to 6 months. Although Moringa leaf tea has been produced by many factories, small business opportunities can help the family economy (Britany and Sumarni, 2020).

Moringa leaves can be processed in various food and beverage products such as clear vegetables, juice, omelets, chips, nastar, donuts, bakwan and Moringa leaf noodles. In addition, Moringa leaves can be processed as herbal drinks. Currently, with the Covid-19 pandemic worldwide, many alternative herbal ingredients are consumed by the public to increase body nutrition in order to prevent transmission of the virus, one of which is Moringa leaves. Moringa plants have high nutrients, such as vitamin C, calcium content, vitamin A, potassium content, and protein. The purpose of implementing this PkM activity is to provide information and provide assistance to the community in utilizing Moringa plants to prevent Covid-19, as well as improving community skills in making Moringa leaf herbal drinks in preventing Covid-19. This PkM was held at the Ori Angu Farmer's Group in Pambotanjara Village with a series of activities, namely the socialization of the importance of Moringa leaves, preparation of raw materials for making Moringa leaf herbal drinks, and the practice of making Moringa leaf herbal drink products. The result of this activity is the implementation of socialization of the use of Moringa leaves as a way to increase body immunity in order to prevent viruses and the implementation of the practice of making Moringa leaf tea with members of farmer groups, students and lecturers at the Ori Angu Farmers Group, Pambotanjara Village (Nganji et al., 2021). KKN was held at the in Air Joman Village, with a series of activities including the socialization of the importance of Moringa leaves, the preparation of raw materials for making herbal moringa foods, and the practice of manufacturing Moringa leaf herbal food products. The results of this activity were the socialization of the use of Moringa leaves as a way to increase immunity in order to prevent viruses and the practice of making Moringa leaf tea with village head, students and lecturers at Air Joman Village (Lubis et al., 2021)

### **Moringa as an Immunomodulator in Skincare Products**

#### **Moringa Mask**

Other processed Moringa leaf products are Moringa leaf masks. How to make a Moringa leaf mask is also not difficult. We only need to prepare some ingredients such as dried Moringa leaves, turmeric and rice flour.

#### **Hand and Body Cream**

Moringa can apply in cream skin moisturizer with addition extract 0.3% showed values greater antioxidant activity than comparative form of cream commercial in the market. Cream product tested characterization has been qualified according SNI 15-4399-1996 quality skin moisturizer (Hardiyanthi, 2015) and moisturizer pH 7.82, viscosity 6853cP and specific gravity 0.9652 g/l (Susanty et al., 2019).

### **Moringa as an Immunomodulator in Food Snack Products**

The Covid-19 pandemic condition requires everyone to eat highly nutritious foods to increase immunity so that they are not susceptible to disease. Gracillaria and Moringa are functional foods that can be developed and have the potential as a source of antioxidants. The purpose of this study was to analyze the effect of the addition of Moringa leaves on antioxidant activity, total phenolic and organoleptic test results on the development of Gracilaria products. antioxidants, total phenolic content, and organoleptic assays. Based on the analysis of the



macro and micro nutritional content of Gracilaria flour, the results obtained were 15.54% water content, 3.78% ash, 7.32% protein, 0.40% fat and 65.54% carbohydrate, 114.70 $\mu$ G/mL antioxidant content. and total phenolic 6.82MgGAE/g. Meanwhile, in Moringa leaf flour, the water content was 8.87%, ash 10.36%, protein 23.62%, fat 4.76% and carbohydrates 44.76%, antioxidant content 29.91 $\mu$ G/mL and total phenolic 32.25MgGAE/g. Based on the results of the determination of the formulation and organoleptic test, it was found that F2 showed the best results with an overall acceptance value of 3.45, antioxidant content 146.33 $\mu$ G/mL and total phenolic 7.28MgGAE/g extract. The addition of Moringa in the product development of Gracilaria sp. increased antioxidant content, total phenolic content with p-value 0.05 (Hervidea and Kustiani, 2022)

#### Moringa as an Immunomodulator in Herbal Medicinal Products Morricecare®

Morricecare is formulated from Moringa extract and ant nests, and is packaged in capsule form. The laboratory tests required to obtain a distribution permit from the Food and Drug Supervisory Agency of the Republic of Indonesia are bacteriological tests and heavy metal contamination tests.

Type of Analysis	Unit	Specification	Result	Methods
<b>Heavy Metal Contamination</b>				
Pb	ppm	$\leq 10$	0.0008	AAS
Cd	ppm	$\leq 0.3$	0.0020	AAS
As	ppm	$\leq 5$	0.0080	AAS
Hg	ppm	$\leq 0.5$	0.0007	AAS
Water content	%	$\leq 10$	5.35	Fl edisi V:2014
Ruined time	minute	$\leq 60$	5 minute 29 detik	Fl edisi V:2014
<b>Microbiological contamination</b>				
Total plate number	Koloni/g	$\leq 10^5$	$2.8 \times 10^2$	Fl edisi V:2014
Our mode number	Koloni/g	$\leq 10^3$	$1.2 \times 10^1$	Fl edisi V:2014
Escheria coli	Koloni/g	$\leq 10$	$<1.0 \times 10^1$	ISO 16649-2:2001
Salmonella spp	/g	Negatif	Negatif	Fl edisi V:2014
Esterobacteriaceae	Koloni/g	$\leq 10^3$	$<1.0 \times 10^1$	ISO 21528-2:2004
Clostridia	/g	Negatif	Negatif	Fl edisi V:2014
Shigela	/g	Negatif	Negatif	WHO, 2007



Regular consumption of Moringa leaves has also been shown to improve growth performance and immunity. Moringa leaves can work as an immunomodulator. Moringa leaf extract can regulate inflammatory stimuli by controlling cell migration, proliferation and chemotaxis. Moringa leaves have an inhibitory effect on airway inflammation by regulating Th1 and Th2 cytokines, improving vital lung capacity and maximal expiratory volume. Moringa leaves are the main source of flavonoids such as kaempferol and quercetin. Moringa leaf ethanol extract significantly stimulated humoral and cellular immunity by increasing immunoglobulin levels. Polysaccharides in Moringa leaves have also been shown to increase macrophage activity through the release of nitric oxide as phagocytic activity increases. These polysaccharides also increase the albumin/globulin ratio, phagocytes 210 and respiratory bursts which help increase immunity (Mehwish et al., 2020). Immunomodulators are agents that have the ability to amplify or suppress the host immune response in combination with other therapeutic modalities. Immunomodulators from natural products are commonly used to prevent various diseases such as cancer, autoimmune diseases and inflammatory disorders. Moringa leaves have immunomodulatory activity by working as antioxidants, having hepatoprotective and renoprotective effects, and preventing lipid peroxidation. Malondialdehyde production decreased after consuming Moringa leaves (Khan et al. 2021).

Micronutrients such as vitamins and minerals have an important role in strengthening the body's immune system. The necessary micronutrients include vitamins A, C, D, E, B2, B6 and B12, folic acid, beta carotene, calcium, magnesium, copper, iron, selenium and zinc. This micronutrient deficiency will reduce the body's immune system so that immune function decreases (Bhattacharjee 2020). Moringa leaves have antitumor, antioxidant, anticancer, antibacterial, anti-carcinogenic and anti-inflammatory effects. Moringa leaf extract has been shown to control stress hormones (cortisol and adrenaline), leptin, and cytokines (IFN- $\gamma$ , TNF- $\alpha$ , and IL-10) due to heat stress (Abdel-Latif et al. 2018). Many studies show that Moringa leaves can prevent bleeding, prevent anemia, help maintain blood glucose levels, accelerate the process of growth of new cells and tissues, prevent coronary heart disease and as a source of fiber. Moringa leaves have a very good hypoglycemic potential to help relieve diabetes mellitus (Wang et al. 2017). Moringa leaves contain lots of protein, minerals, beta-carotene, and antioxidants. In traditional medicine, the leaves, seeds, stems, flowers, and roots are used to treat several diseases such as malaria, typhoid fever, parasitic diseases, arthritis, swelling, toothache, urinary tract disorders, anemia, hypertension and diabetes. Giving Moringa leaves can significantly prevent the occurrence of mental retardation, haematotoxicity, changes in liver function, immunosuppression, oxidative stress, and genotoxicity (Ibrahim et al., 2021).

Moringa leaves are known as antioxidants, anti-inflammatory, immunomodulatory and anticancer (Xiao et al., 2020). As an immunomodulator, Moringa leaves can significantly increase the number of white blood cells and immunoglobulin cells, thereby stimulating humoral and cellular immune responses. The results showed that administration of Moringa leaves could increase total protein, albumin, globulin and lysozyme (Ayoub et al., 2019; Khalil & Korn, 2017). Thus, Moringa leaves can be used as an alternative therapy to overcome various diseases related to low immunity, because Moringa leaves contain micronutrients to strengthen the immune system. In HIV infection, Moringa plant miRNAs have been shown to regulate immune responses (Minutolo et al., 2021).

Moringa leaf administration can improve renal leukocyte cell phagocytosis, respiratory burst and peroxidase activity. Also, serum humoral components, including proteases, ACH50 and lysozyme activity and IgM levels. Moringa leaves also improve skin mucosal immunity such as protease, antiprotease, peroxidase and lysozyme activity. Furthermore, administration of Moringa plants also regulates intestinal mucosal immunity genes (lyso and c3), tight junction proteins (occludin and zo-1) and anti-inflammatory cytokines (TGF- $\beta$ ) and down-regulates pro-inflammatory cytokines (TNF- $\alpha$ ). (Mansour et al., 2018). The efficacy of Moringa as an immunomodulator is proven by consuming 1 capsule three times a day, it can recover from Covid 19 and for those who have not been affected, taking 1 capsule a day has succeeded in preventing not contracting Covid and staying healthy

## CONCLUSION

Moringa can be used to increase immunity for shrimp by adding Moringa extract, while fish immunity is also increased by injection of Moringa extract. Immune enhancement in humans is consumed in the form of tea, snacks, vegetables, food and skincare (creams, lotions and masks) and the herbal medicine Morricecare has been successfully formulated as an immunomodulator for human health. During the COVID-19 pandemic, early 2020 to 2021, by consuming Morricecare 3 times a day, you can recover from COVID-19 symptoms within 1 week. This proves that Moringa is effective as an immunomodulator agent. Moringa leaves are often processed into soup or crushed into herbal medicinal powder. These leaves are also often used as herbal ingredients for endurance by Indonesians, including children. This plant with the Latin name *Moringa oleifera* has the effect of increasing endurance in several ways. First, Moringa leaves are able to work directly against harmful viral, bacterial and fungal pathogens. The content of amino acids and flavonoids can reduce the survival of harmful microorganisms in the body. Second, this plant has quite complete nutrition and is very good for health.

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**IMPACT OF ORGANISATIONAL CLIMATE ON EMPLOYEE PERFORMANCE: A CASE STUDY OF INDIAN IT SECTOR**

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**<sup>1</sup>Ms. Renu Bharti and <sup>2</sup>Ms. Shalini Nigam**<sup>1</sup>Research Scholar and <sup>2</sup>Professor, Department of Management, Dayalbagh Educational Institute, Agra**ABSTRACT**

*This paper aim is to study the climate of the organisation and its impact on employee's performance. The employee performance is substantially depends upon the climate that prevailed in each organisation for case positive stimulant and provocation at organisation leads to positive performance at organisation, negative climate leads to slow performance at organisation position. The satisfaction with organizational climate appreciatively affects the performance and has negative relationship with development and counter culturist geste of the workers at work. This composition intended to assess the organizational climate and its impact on hand's performance. This study also researched the position of climate which influences the hand's performance. Positive or Negative climate prevailing in the association are prognosticated and analysis are carried out. To achieve this defined ideal questionnaire is prepared. The set questionnaire is used to get the direct responses from eighty workers. The responses given by the workers are anatomized and interpreted using the different type of statistical tools like Correlation, Chi-square and Anova. workers are the main asset of associations for delivering services. A work terrain should be created where workers feel appreciated for their sweats.*

*Keywords: Organisational Climate, Performance, Information Technology , productivity*

**INTRODUCTION**

Organizational Climate is comprised of a mix of morals, values, prospects, programs and procedures that impact work provocation, commitment and eventually individual or work unit performance. Climate can be defined as the perceived attributes of an association and its subsystems, as reflected in the way an association deals with its members, groups and issues. The Emphasis is on perceived attributes and the working of subsystems. Positive Climate encourages, while negative climate inhibits optional trouble. 'Organizational Climate ' refers to the quality of working environment. However, they're more likely to contribute appreciatively to the achievement of business issues, If people feel that they're valued and admired within the association. Creating a ' healthy ' organizational climate requires attention to the factors which impact workers ' comprehensions, including the quality of leadership, the way in which opinions are made and whether the sweats of workers are honored. Organisational climate influences to a great extent the performance of the workers because it has a major impact on provocation and job satisfaction of individual workers. Organisational climate determines the work terrain in which the hand feels satisfied or displeased. Since satisfaction determines or influences the effectiveness of the workers, we can say that organisational climate is directly related to the effectiveness and performance of the workers.

According to Forehand and Gilmer, "Climate consists of a set of characteristics that describe an organisation, distinguish it from other organisations are fairly enduring over time and impact the geste of people in it."

Organisational climate is a fairly continuing quality of the internal terrain that's endured by its members, influences their geste and can be described in terms of the value of a particular set of characteristics of the organisation. It may be possible to have as numerous climates as there are people in the organisation when considered inclusively, the conduct of the individualities come more meaningful for viewing the total impact upon the climate and determining the stability of the work terrain.

**REVIEW**

**Limna, P and Siripi, S and Sitthipon, T and Jaipong, P and Autta, P (2022),** Innovation is the process of creating and selling commodity new. therefore, an important and salutary way to produce the inventions is the operation invention and technological invention to produce a working invention climate. In general, organisational performance is the outgrowth of operation invention, technological invention and invention climate. therefore, the relationship between inventions( operation, technology, climate invention) and organisational performance is essential to probe. This study reviewed the abstract model of the relationship between operation invention, technological invention, invention climate and organisational performance. This exploration identifies the link between measures regarding their sweats to increase organisational performance during the technological metamorphosis period.

**Obeng, A. F., Zhu, Y., Azinga, S. A., & Quansah, P. E. (2021).** Organizational performance has made it imperative for country and community bank operation to employ the stylish organizational conditions that impact hand's performance. the study examines the effect of organizational climate on job performance. Valid responses entered through a structured questionnaire were 431. the findings revealed that, first, harmonious work passion incompletely intermediated organizational climate and job performance relationship. Second, leader – member exchange negatively moderated the relationship between organizational climate and harmonious work passion. Eventually, still, guiding as a operation practice appreciatively strengthened organizational climate and job performance relationship.

**Mutonyi, Barbara & Slåtten, Terje & Lien, Gudbrand. (2020).** The idea of this study is to examine the part of organizational climate in workers ' creative performance using the public sector as an empirical environment. The workers ' creative performance is divided into two realities and studied as two separate effect variables individual creativity and individual innovative geste. A abstract model is developed and tested in a check in which workers of a public sector association shared. The findings indicate that organizational climate has an important part in workers ' creative performance. The organizational climate showed a positive and significant link to the two creative performance variables included in this study. also, the study revealed that individual creativity mediates the relationship between organizational climate and individual innovative geste

**Toopalli, Sirisha and Lakshmi, Y.P. Sai (2019)** this study aims to know the climate of the organisation and its impact on employee's performance. The employee performance is mostly depends upon the environment that prevailed in each organisation for instance positive encouragement and motivation at organisation leads to positive performance at organisation, negative climate leads to slow performance at organisation level. The satisfaction with organizational climate positively affects the performance and has negative relationship with turnover and deviant behaviour of the employees at work. This article intended to assess the organizational climate and its impact on employee's performance.

### Need of the study

After assessed different examination studies, Climate is the turn of learn together or society. It concludes how people significant other with one another and with outsiders. climate, as the baffling mix of distrust, approaches to acting, stories, legends, likenesses, and various considerations that fit together to portray being a person from a particular culture. various leveled climate is vital part for gaining ground concerning definitive prosecution. colorful leveled climate has converted into a huge part to definitive appropriateness. relations culture's progress began when individual in affiliations started to examine their reasonability and expected to get and cultivate definitely described aims and targets. legal climate is seen logically as a huge determinant of organization's display, fills in as one of the most mind- blowing administrative control instrument.

### Objectives of the Study

- To study the relationship between Organisational Climate and employee performance.

### Hypothesis

HO: There is no positive relationship between organizational Climate and employee performance

H1: There is no positive relationship between organizational Climate and Employees productivity

### Research Methodology

This present study attempts to study the types of culture in an organization and to test the significant relationship between organization culture and performance. **The necessary data were collected through structured questionnaire.** Analytical and descriptive type of methodology was followed. The study depends on primary and secondary data.

### Area of Study

Organisational Climate and its impact on performance is relevant to IT industries has the IT Sectors consists of multi Climate environment in the workplace. Therefore, the research was contacted in different IT companies to achieve the precise feature features of organizational Climate and its impact on employee performance. The study covered different IT companies in India.

### Sampling Size and Design

The primary data were collected through survey method. Survey was conducted directly and through electronic mail using well developed Questionnaire. **Convenience Sampling has been done for generating data.** Totally 120 Questionnaires were distributed and 90collected out of which 80 completed questionnaires were found usable.

**Questionnaire Design**

The primary data were collected through questionnaire survey. The respondents were asked to give their opinion on organizational culture, commitment of the employees working in the organization and performance of the employees. The opening division of the survey comprises of employees individual details and their perceptiveness on organizational culture and performance has elective questions. The next part consists of questions relating to organizational culture, and performance, with Likert's 5 point scale.

**Table 1:** Demographic variables of the Respondents

<b>Demographic Variable</b>	<b>Frequency(80)</b>	<b>Percentage</b>
<b>Age Group</b>		
Below 25	13	16.25
26-35	38	47.50
36-45	12	15.00
46-55	09	11.25
Above 55	08	10.00
<b>Gender</b>		
Male	58	72.5
Female	22	27.5
<b>Years Of Experience</b>		
Below 1 year	10	12.5
2-5 years	28	35.0
6-10years	22	27.5
11-15years	14	17.5
Above 15 years	06	7.50
<b>Monthly Income</b>		
10,000-25,000	15	18.75
26,000-35,000	10	12.5
36,000-45,000	12	15.0
46,000-55,000	30	37.5
Above 55,000	13	16.25

**Does Organizational Climate Determines the Productivity Level of Organization?**

<b>Level of acceptance</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Cumulative %</b>
Strongly Disagree	11	13.75	13.75
Disagree	13	16.25	30.00
Undecided	10	12.50	42.50
Agree	20	25.00	67.50
Strongly Agree	26	32.50	100
<b>Total</b>	<b>80</b>	<b>100</b>	

**Interpretation:** The table above shows that 16.25 % of the respondents Disagree and 25.00 % of the respondents agree that organizational culture has effect on employee job performance. Also, we have 12.50% of the respondents who are undecided, and 32.50 % of the respondents who strongly agree that organizational culture has effect on employee job performance.

**Is There any Positive Relationship Between Organizational Climate and Employee Job Performance?**

<b>Level of acceptance</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Cumulative %</b>
Strongly Disagree	4	5.0	5.0
Disagree	6	7.5	12.5
Undecided	10	12.5	25
Agree	20	25	50
Strongly Agree	40	50	100
<b>Total</b>	<b>80</b>	<b>100</b>	

**Interpretation:** From the table above, 25 % of the respondents agree, 50% of the respondents strongly agree, 17.5 % of the respondents are undecided, 7.5% of the respondents disagree and 5% of the respondents strongly disagree that there is a positive relationship between organizational culture and employee job performance.



**H0 There is no positive relationship between climate of organization and job performance.**

Acceptance level	Observed (O)	Expected (E)	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
Strongly Disagree	6	16	-10	100	6.25
Disagree	10	16	-06	36	2.25
Undecided	20	16	04	16	1.00
Agree	40	16	24	576	36.00
Strongly Agree	4	16	-12	144	9.00
					54.50

**Interpretation:** As per above analysis, the calculated value of chi-square at df 4 i.e 11.62 which is greater than tabulated value i.e. 9.488. This depicts that alternative hypothesis H1 and rejects H0 which indicate a positive relationship between organizational culture and employee job Performance.

**H0 There is no positive relationship between organizational climate and employee productivity.**

Acceptance level	Observed (O)	Expected (E)	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
Strongly Disagree	11	16	-5	25	1.56
Disagree	13	16	-3	9	.56
Undecided	10	16	-6	36	2.25
Agree	20	16	4	16	1
Strongly Agree	26	16	10	100	6.25
					11.62

**Interpretation:** As per above analysis, the calculated value of chi-square at df 4 i.e 11.62 which is greater than tabulated value i.e. 9.488. This depicts that alternative hypothesis H1 and reject H0 which indicates that a positive relationship between organizational climate and employee productivity.

**FINDINGS**

1. A Majority of respondents (72.50%) strongly agree that corporate climate has effect on employee's performance.
2. 32.50% of the employees also agree that corporate climate decide the productivity level of the organization.
3. This analysis shows that there is a positive relationship between organizational climate and employee's job performance. This proved in the first hypothesis tested in which the calculated value of chi-square 54.50 is greater than the table value of 9.488.
4. There is also a positive relationship between organizational corporate climate and organizational productivity. The calculated value of chi-square 11.628 is greater than the tabulated value 9.488 and accept alternative hypothesis two and reject null hypothesis two.

**SUGGESTIONS**

1. The suggestions are made to the bank management and other organizations that are interested in changing their climate in order to develop their employees job performance.
2. Every individual has distinct climate and culture that he works with when joins in an organization that has a utterly different culture and attitudes from his own, he should be allow to adopt himself first with the organization's climate to know whether he can pick up or not. The ability of employee is to learn with the organizations culture that will determine how he will perform on his job.
3. In cases where an organizational climate needs to be changed, employees must first of all be informed and made to learn the change of the existing climate as this will impact their performance.

The culture of the Organization must be blending on all staff member of the company as this will improve uniformity among members of the organization and thus highlight commitment and group efficiency in terms of organizational productivity

**CONCLUSION**

Good organizational climate creates good society as well as good citizens. So the impact of culture plays a major contribution in any society. Organizational climate is the binder that combines people together and makes them part of the organization experience. A strong corporate climate refers to how broadly and steeply

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employees engaged in business process and tasks. Organizational culture guides the sense-making process. It aids employees understand what happens and why things happen in the organization. This study reveals that corporate climate is vital in every organization and that it has positive impact on employee's performance. The climate of the corporate will affect the level of organizational productivity in a positive way. This paper reveals that there is a positive relationship between climate of the organization and job performance.

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**A FRAMEWORK TO EVALUATE PERFORMANCE OF ROUTING ALGORITHM IN VANET**

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Bidholi, Dehradun, India- 248007**ABSTRACT**

*The challenge to select the best routing algorithm for network performance is a major concern in present research area. Vehicular Adhoc Network (VANET) has its own difficulties in deploying routing algorithm. The standard algorithm like DSDV, AODV, OLSR and some bio inspired routing algorithm are already available for VANET. In this paper authors discussed the problem and proposed a new framework that has been applied and tested on such routing algorithm to analyse the performance of selected routing algorithm. The Ad Hoc On-Demand Distance Vector (AODV) routing protocol is used for three distinctive traffic scenarios in the VANET environment. Open Source tools like SUMO, NS is opted for simulations. Simulation of Urban Mobility (SUMO 0.32) is the traffic simulator and Network Simulator NS-3.29 is used for network simulation to acquire the experiment results. The simulation is executed for three considered traffic scenarios are taken including realistic city traffic scenarios of Dehradun city. Through this paper, the authors wish to present the best way for performing and testing the routing protocols in VANET. Through the simulation test results it is concluded that the proposed framework is best fitted for VANET routing performance evaluation.*

*Keywords: VANET, DSDV, AODV, OLSR, SUMO, NS, Simulation*

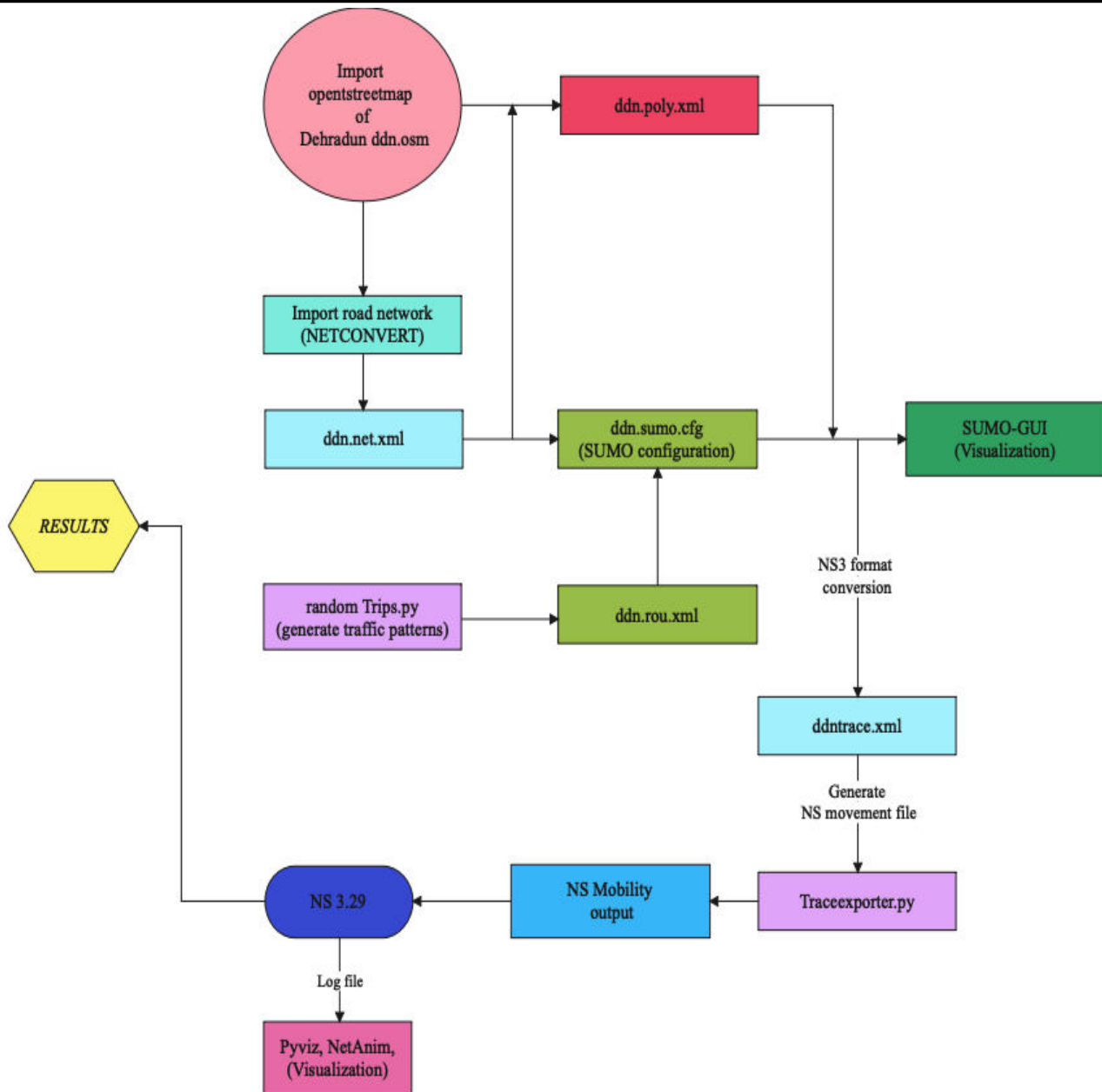
**1. INTRODUCTION**

Vehicular Ad hoc Network (VANET) is one of the fastest evolving research in the domain of Intelligent Transportation Systems (ITS). When closely looked at the taxonomy of ITS, it can be seen that the major concern is VANET routing and security. However, many international consortiums are already working on it with their agendas and products. As high cost involved in real-time testing hence simulation software is used to get proposed results. So, none of the research consortiums is directly testing their hypothesis on the field. Instead, they first create real-time scenarios using various software tools and then test them using simulation experiments. After getting the desired results, they test that with actual hardware in real-time fields [1]. Presently due to the emergence of cloud services and the Internet of Things (IoT), there will be a revolutionary change in the architecture of today's traffic and transportation system in the near future. VANET performance depends on various routing protocols and wireless standards. Otherwise, timely communication and delay in data packets may cause accidental disasters in real-time of ITS implementation [2]. For testing various routing protocols, simulation tools are also used to verify the analysis of the results. Many open-source and proprietary tools are already available, but none of the standard simulation software can fulfil all the real-time scenarios.

A new framework is proposed in this paper that makes the simulation experiments in VANET much easier and is very beneficial for the researchers to get the desired results.

**2. PROPOSED FRAMEWORK**

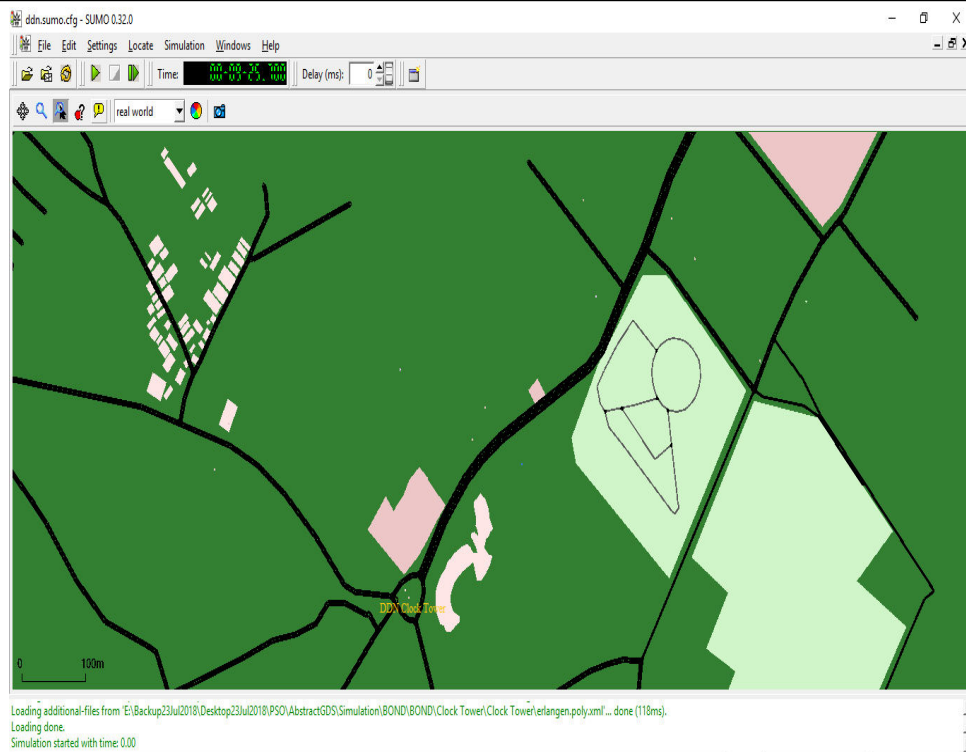
In this section, a proposed framework is presented and same was tested to verify the various research simulation experiments and implementation. This approach helps in performing the research test in a much simpler and faster way. The result analysis is also instant as data can be get instantly in many formats and viewed as per need. From the present experience, this can be stated that the computing resource must be robust enough so that no lagging or outages come during the execution of any simulation task. The simulation experiments were performed on HP Workstation with specification of 3.4 GHz. Core i7-8700 processor and memory of 16GB RAM. Earlier, the experiment was tried on Core i3 Laptop, but the results were not satisfactory and took too long to run, sometimes simulation stopped automatically. The framework shows that we need to iterate the simulation experiment many times to get the desired results. Hence, it is always better to use a high end machine to deploy the proposed framework.



**Figure 1** Designed and proposed framework for simulation experiments

The proposed framework is illustrated in figure 1 illustrates. The same framework has been used to perform all the research simulation tests. The designed and proposed framework was deployed for VANET simulation tests and is performed on above mentioned HP workstation. The proposed framework shows that only open-source tools such as Ubuntu 16.04 operating system [3] is used to setup the VANET simulation. Simulation of Urban Mobility (SUMO 0.32) [4] is used for traffic simulations and NS-3.29 is used for setting up network simulations [5] as presented in the designed framework. The real city scenario is deployed by importing Dehradun map through [www.OpenStreetMap.org](http://www.OpenStreetMap.org) [6] for a realistic city traffic scenario. As shown in framework it is used for the SUMO network by converting it for real traffic simulations.

The imported OSM map is converted through the netconvert command: “netconvert --osm-ddn.osm --o ddn.net.xml”. Then randomTrips.py is used for adding the desired trip and routing in the network through the python scripts. This random trip script randomTrips.py applied through the command: “py randomTrips.py -n ddn.net.xml -r ddn.rou.xml -e 50 -l -e” to generate the route, and this generates an automatic file with extension .rou that was named as ddn.rou.xml. This completes the research simulation process at this stage. The route of the vehicle is defined as a set of edges. The separate file for the trip is also generated with the departure and end node. Next, run the network using SUMO configuration file ddn.sumo.cfg. This generates the traffic flow and road map for the real city scenario imported from openstreetmap.org. The road map generated is shown in figure 2. The last step is python script execution through “\$./waf --run ddn.py --visualize” command at NS-3.29 shell prompt and netanim-module.h is included as a header file for network animator in NS-3.29.

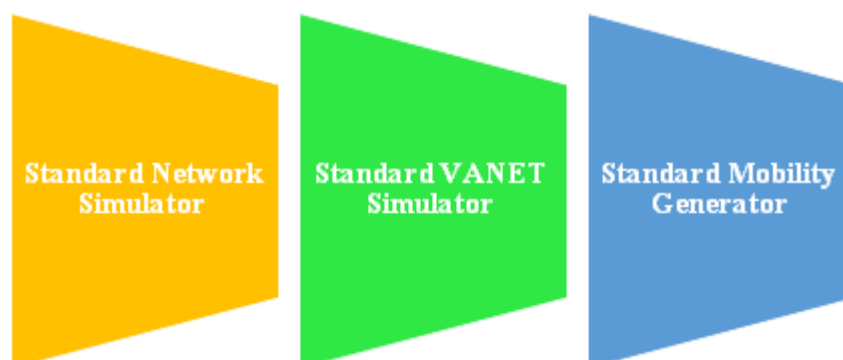


**Figure 2** Dehradun city map converted from OSM

The same methodology is used in many other research works to predict the routing issues in VANET using swarm intelligence techniques and its validations. However, other methods are also available to perform the simulation test but the proposed framework provides a waterfall approach to implement the simulation tests in VANET.

### 3. VANET SIMULATORS

Many network simulators are already available to implement VANET research experiments. Some proprietary VANET simulators such as QualNet, Carisma, Daimler-Chrysler, OPNET, TSIS-CORSIM, Paramics, and VISSIM [7]. These closed source tools are not available to those who are not associated with these projects. Hence, researchers in academia are dependent on only open-source software tools for all the experimental works. The VANET simulation software can be classified into three distinguished categories: Standard Network simulator, VANET Simulator, and Mobility Generator, as illustrated in figure 3.



**Figure 3** Types of VANET Simulators

Vehicular mobility generators provide real city road network traces as input for the network simulator. It includes vehicle speed, road model, and increase/decrease of vehicle counts. Some of the most popular open-source mobility generator tools are MOVE, STRAW CityMob, SUMO, FreeSim, VanetMobiSim, and NETstream [8].

Standard network simulators like NETSIM and NS are used for Mobile Ad hoc Network simulations, but VANET's mobility generator extension can also be used for VANET simulations. These are GTNetS, SNS, GloMoSim, and NS2 [9]. Network simulation and traffic simulation can be performed using VANET simulators such as VENTOS, VANETsim, GrooveNet, TraNS, MobiREAL, and NCTUns. Now Veins is also getting popularity. It is an open-source simulator designed for VANET. It is the integration of SUMO and OMNET++

[10]. But none of the VANET simulators is best suited for all types of simulation tests. VANET simulation depends on various scenarios that cannot be verified through any of the above-discussed tools. So the designed framework in this research is used to perform the simulation test on a real city scenario. The performance analysis and measurement of the average throughput using the Ad Hoc On-Demand Distance Vector (AODV) routing protocol are performed to validate the designed framework.

#### 4. SIMULATION PERFORMED TO EVALUATED THE DESIGNED FRAMEWORK

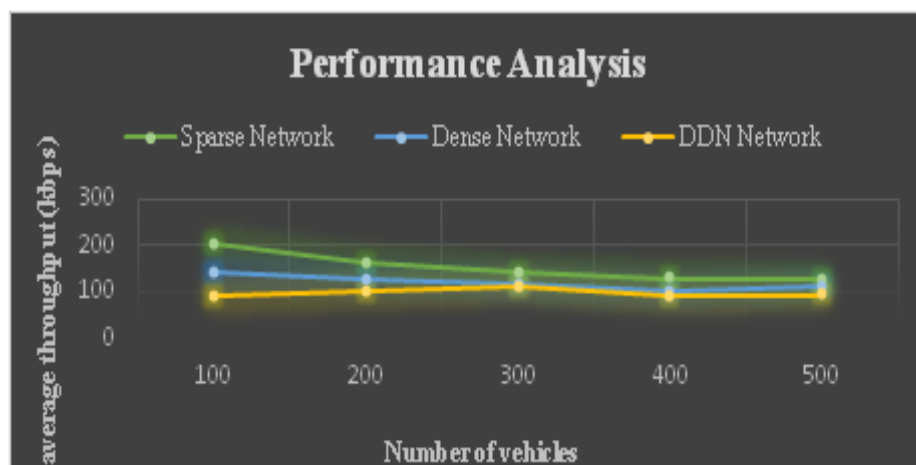
This section illustrates the results of the simulation tests performed based on the proposed framework. Table 1 specifies the properties of the simulation parameters. In this research work, the objective is to evaluate the designed framework so, the main performance metrics is considered for validation. This section presents the result obtained through this performance metric, i.e. average throughput. The others will be taken in future work of this research work. The simulation was performed for three VANET scenarios. The first is the sparse network, the second is the dense network, and the third is for the real city traffic scenario imported from osm. The above-discussed framework is deployed to test the Ad hoc On-demand Distance Vector (AODV) routing protocol to verify the performance of AODV on selected traffic environments. The comparing of various performance metrics is not in the scope of this research work. Hence, the methodology and framework developed for presented simulation work is easier to perform in VANET using specified open-source tools. The data considered to calculate average throughput is in kbps for AODV protocol is as specified in table 2 and performance analysis shown in figure 4.

**Table 1** Simulation Parameters for the proposed framework

Parameters	Details With Specification
Operating System	Open Source OS UBUNTU 16.04
Network Simulator	Open Source Simulator NS 3.26
Traffic Simulator	Open Source Simulator SUMO 0.32
Realistic City Traffic Map	Open Street Map (Dehradun City)
Mobility Model	Manhattan Mobility
Transmission range of network	150 m to 200 m only
Data Packets size	Data packets of 200 bytes only
Intervals	0.2 seconds
Data rate	2 Mbps only
Protocol	802.11p MAC layer
Speed	Up to 80 km/h only (as per the speed limit of the city)

**Table 2** Throughput results captured through simulation

Number of Vehicles	Average Throughput (kbps)		
	Sparse Network	Dense Network	DDN Network
100	200	140	90
200	160	125	100
300	140	115	110
400	130	100	90
500	125	110	95



**Figure 4** Performance analysis of the results captured through simulation test

The presented work is not focusing on the performance issues of routing protocols. Instead, this work presents the framework to perform and evaluate the performance of AODV routing algorithm. The simulations performed in VANET scenarios through open source tools like Ubuntu, SUMO, NS3, OSM, and python. However, it can be concluded from the above analysis that AODV performed superior in sparse networks, and the performance is least in real city scenarios. The same can be used for further testing of other routing protocols with different performance metrics like transmission time, packet delivery ration, network delay, packet loss etc.

## **5. CONCLUSION**

This paper has presented some of the primary open-source software tools widely accepted by the research community for realistic simulation tests. The VANET has emerged as a dynamic platform to perform simulation tests and verify the results based on various parameters, including routing protocols. The chapter focuses on developing the new optimized methodology for testing VANET simulations and is discussed in this paper. It has been concluded that the community would surely get results faster and easier by adopting this methodology for research. The same has been demonstrated in this paper by showing AODV routing protocol performance analysis of average throughput. In the future work of this research paper, the same methodology and framework will be deployed to verify the simulation performance analysis of Swarm Intelligence-based routing algorithms. Hence, it can be confidently stated that the open-source VANET simulation tools are a boon to the research community.

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## HRBPNNCSO BASED LUNG DISEASE CLASSIFICATION USING CHEST X-RAY IMAGES

Dr. D. Napoleon and I. Kalaiarasi

<sup>1</sup>Assistant Professor and <sup>2</sup>Research Scholar, Department of Computer Science, Bharathiar University, Coimbatore, Tamilnadu, India**ABSTRACT**

*Lung diseases are most dangerous and leading disease around this world. In this study we proposed two machine learning algorithms for classifying the lung diseases. The Hybrid Regression Support Vector Machine (SVM) and Artificial Neural Network of Back Propagation Neural Network (ANN-BPNN) with Chicken Swarm Optimization (CSO) is called as HRBPNNCSO used to predicting the respiratory diseases of Lung Cancer, Pneumonia and Normal lung with Chest X-Ray images. In this system, the ANN with back-propagation algorithm used for training the network. The regression SVM used to choosing the best model for classification through kernel function. Totally, there are 1500 images were used for training and testing which are separated 500 as cancer, 500 as normal and 500 images as pneumonia from Kaggle web source. The pre-processing performed with Weiner filter to enhance the noise image. Then K-means segmentation has been applied on pre-processed image for segmenting left and right side of the lungs. After the features are extracted through Grey Level Co-occurrence Matrix (GLCM) into 13 numbers of features. The main purpose of HRBPNNCSO is improving the classification accuracy which can support the early prediction of respiratory diseases. Finally, the performance of the proposed method has been evaluated in terms of sensitivity, specificity and accuracy which is helpful to choosing the best model for lung disease classification.*

**Keywords:** ANN, CSO, CXR Image, GLCM, HRBPNN, K-Means Cluster, SVM

**1. INTRODUCTION**

The millions of people can affected from various diseases in this world. But most of the people affected by respiratory system diseases which are cancer, pneumonia, COPD, tuberculosis and recently the covid-19. Classifying the respiratory diseases is one of the difficult work for untrained physician due to taking a different kind of parameters from the respiratory system [1]. Physician need the medical history and physical examination details for the patient while diagnosing of respiratory illness [2]. Therefore, these information's are not available in a computer processing and also we need expert radiologist to find out the problem. If diagnose a disease or classify the image as cancer, pneumonia and normal means first we have to identify the patterns. The identification of pattern is very difficult because if we are having the data is too large. However, we cannot use the traditional methods to identifying patterns or mathematical model due to generally not linear. Therefore, we need efficient technique to identifying disease patterns which is useful to radiologist for diagnose a patient.

The classification of medical images by various researchers using several imaging modalities like CT, MRI, PET, X-RAY. Among these methods the X-Ray and CT images are frequently used by the radiologist and medical physician for detecting the abnormalities. Thus, many doctors have advised to consider the chest X-Ray images for analysing diseases especially in this covid-19 time. Many researchers using X-ray images for analysing diseases [3]. The economical-wise chest X-Ray image is cost-effective due to low cost and non-invasive too [4].

Recently, several machine learning techniques are successfully used for experimenting various problem especially in clinical settings [5]. First, ANN is a good choice for classification of cancer and other lung diseases. This supervised training algorithm produce results faster than the other traditional classifier [6]. Normally, the ANN has three layers which are input layer, hidden layer and output layer. The input layer and the output layer are connected by an activation function in the hidden layer. In the input layer, each node  $X_i$  has a weight,  $W_i$ . The sum of each node's product with its weight is referred to as a net  $\sum_i^n x_i w_i$ . The net is sent into an activation function, which produces the following prediction or classification:

$$Y_i = f(\sum W_i X_i)$$

But we need of efficient results the support vector machine map the images into hyper plane and its separating it into two linear type which enable the classification. One of the most successful supervised learning models in classification is support vector machine [7] which is creating model for classification. In SVM, the data's are shown as points which are separated by the gap or hyper plane. For example, there are two classes in SVM which are called class I and class II. The SVM trying to place a hyper plane between two classes which is called boundary. The distance between two boundaries are calculated and find the nearest point which is used to

increasing the margin. Data must be labelled to apply the supervised learning, when the data is not labelled, an unsupervised method is required that cluster the data to groups and match the new data with every group. Therefore, SVM algorithm does not affected by the dimensionality problem because it is suitable for even having large dataset. Thus, the combined feature of ANN and SVM is very effective to classifying the data with high accuracy.

This paper has been organised into four different types of chapters. In first chapter a small introduction about the lung diseases. In chapter two some of the related works about the medical image classification using machine learning algorithms are described. The chapter three explain that the methodology of proposed work. The fourth chapter describes the results and discussions to achieve from this work. Finally, in chapter five conclude this proposed work.

## 2. RELATED WORK

Olusayo et.al [8] presents the method for classifying the cancer in human lungs by using ANN and SVM. The author evaluates the performance of these two methods based on accuracy, sensitivity and specificity, true positive, true negative, false positive, false negative. Thus, they compared these two methods and declare that which one is best method for classification. Najadat Hassan et.al [9] proposed a method for detect the abnormality by using CT scan for different diseases. The decision tree classifier was used with N-fold SVM for predict the abnormality in brain images. Ramteke, R. J et.al [10] employed the K-nearest neighbour classification technique which is one of the simplest method and it's based on distance function and voting function. The metric employed is the Euclidean distance

## 3. METHODOLOGY

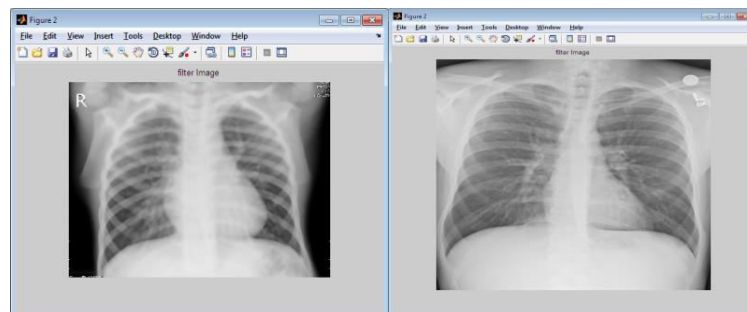
The proposed hybrid system has five phases for classifying the lung chest X-Ray dataset as lung cancer, pneumonia and normal.

### 3.1 Data Acquisition

In this proposed system, the chest X-Ray dataset are collected from the kaggle web sources. Totally, there are 1500 images used for training and testing the data to classify the lung diseases. Kaggle web source is an online community for data science and machine learning techniques. This community mainly focus to solve the problems related with data science and machine learning techniques. The proposed system using chest X-Ray images for experimenting the respiratory problem which is collected from two data sets. The RSNA (Radiological Society of North America) and VinBigData has been used which contain the lung cancer and pneumonia and normal chest X-Ray images. These images are used for training by ANN and SVM for classifying the lung diseases.

### 3.2 Pre-Processing

The pre-processing is one of the preliminary steps for improving the image quality. Here the Weiner filter has been used for pre-processing the chest X-ray images. The Weiner filter is MSE (Means Squared Error) optimal linear filter which is used for enhancing the image quality. Normally the images are degraded by additive noise and blurred which is removed by Weiner filter in efficient way. The results obtained after the noise removed by Weiner filter is shown in figure1.

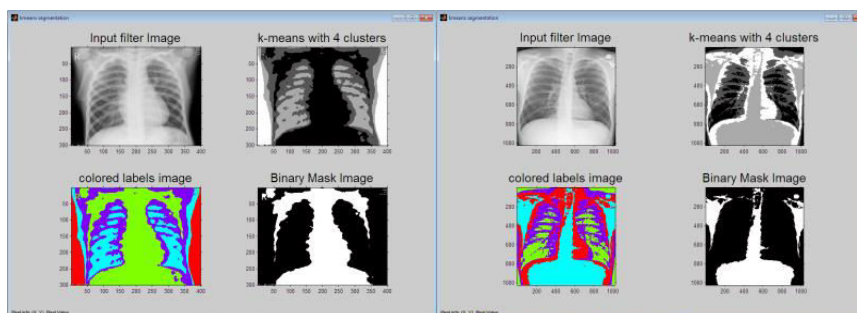


**Figure1.** (a) Pre-processed pneumonia (b) Pre-processed lung cancer

### 3.3 Segmentation

Segmentation means dividing an image into multiple regions for easily identifying an object in an image. The K-Means segmentation has been used for clustering the image. The main objective of this algorithm is combining the data points together which are having similar patterns. To achieving this objective, the K-means identifying the K-centroids in each cluster. First, initialize the K clusters which is refer the number of centroids you need in a dataset. A centroid is a centre of the cluster which is imaginary or real location of centre of the cluster. Every data point assigning to each group of cluster through reducing the sum of square.

In proposed system, the pre-processed output image has been used for segmenting the chest X-Ray images. Here the Euler correlation was used to segmenting the lung image. Totally, four clusters have been defined by K-means algorithm which is used for separating mask value. The mask value has been represented by two dots which are representing the left and right side of the lung. Finally the result obtained after the segmentation of chest X-ray image is given in figure2.



**Figure 2.** (a) Pneumonia clustering image (b) Lung cancer clustered image

### 3.4 Feature Extraction

The features extracted from the segmented left and right side of lung image required for further processing. Here, the feature extraction has been done by using Grey Level Co-Occurrence Matrix (GLCM). The GLCM contains texture and statistical features which are used to classify the images. Totally there are 13 features are extracted from segmented image, based on these features only the data has been classified with correct accuracy. The features extracted are entropy, energy, smoothness, skewness, variance, grey level, contrast etc.

### 3.5 Hybrid ANN and SVM Classification

The advantage of ANN and SVM techniques are very effective usage in classification. The ANN works based on error back-propagated technique, whereas, SVM act as regressor which is structural risk minimization principle. In this proposed work, the combination of ANN and SVM has more space to classify the lung respiratory diseases. The proposed hybrid learning architecture of ANN and SVM has defined as two stages which are stage 1 and stage 2. The first stage, the ANN used as a classifier which distinguishes the data points to different feature cluster. The second stage, SVM used as regressor which is defining the feature model for each cluster and select the best model.

The scheme of the proposed model described as follows,

1. Initializing the number and threshold value of the each feature space.
2. The data set has been classified by ANN.
3. Selecting the best model for each feature space by the SVM.

Some sample data sets are given as an input array which contain real vector, neural weight vector and output vector ( $X, W, Y$ ). First in stage 1, initializing the weights of neural network. Each neuron has one weight for each attribute and the neural weight is represented as  $w_j$  ( $j = 1, 2, \dots, N$ ), here  $N$  stands for number of neural nodes. Find the Euclidean distance or vector dot between the input vector and neural nodes. Determine the winning node among neural network based on increasing the Euclidean distance or decreasing the vector dot product. Update the weight and learning rate. After this, in stage 2 the set of data points which is represented as  $G = \{(X_i, D_i)\}_{i=1}^n$  is given in SVM. The  $X_i$  is input vector in SVM,  $D_i$  is distance and  $n$  is number of patterns to be identified. The data points in this model are non-linearly mapped and high dimensional feature space from input space  $X$ . The value of the kernel is equal to the two vectors  $X_i$  and  $X_j$  in the input data points which is represented as  $\phi(X_i)$  and  $\phi(X_j)$  that means kernel  $k(X_i, X_j) = \phi(X_i) \cdot \phi(X_j)$ . Finally, we can choose appropriate model for the experiments because the kernel parameters are defining structure of the high dimensional feature space for experiments. The linear, non-linear, sigmoid, radial basis is used as kernel function among this which one having lower error prediction that has been considered as best one. The model can suitably even if different dynamic feature space and it reduces the training time and also increases the prediction accuracy.

#### 3.5.1 CSO Optimization

A CSO is an optimization algorithm which is used for obtaining the optimum solution in classification of lung diseases based on threshold value. Initially, setting the number and threshold of the feature spaces then optimize the feature parameters using CSO. The figure 3 shows the optimization process of CSO algorithm which is given below,

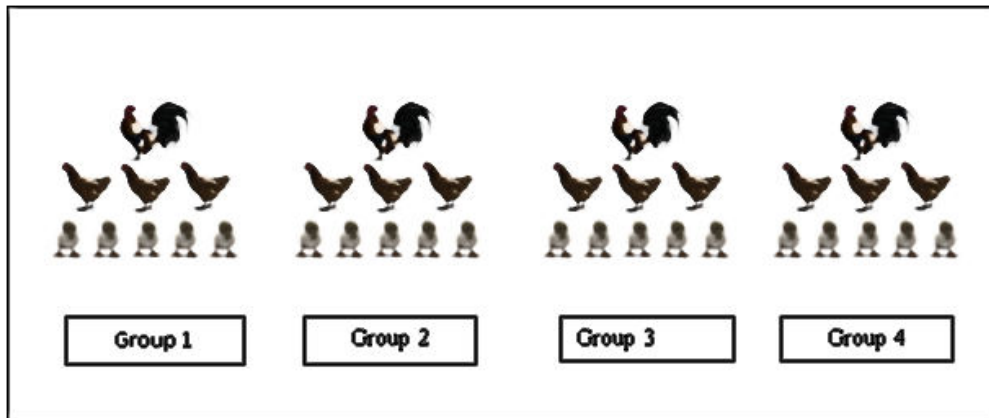


Figure 3. CSO optimization

Initialize positions for chickens randomly and to compute the fitness value for each chicken, select the global best position of the population and the local best position of every chicken, and initialize iteration times. If it equals zero ( $\%$  is the remainder operator), sorting all the chickens in the descending order of fitness values, the best individuals are chosen as roosters, the worst individuals are chicks, and others are hens. Divide the population into several groups, each of which includes one rooster, several hens, and chicks that randomly select their spouse and mothers, respectively. Then update the positions for roosters, hens, and chicks and compute their fitness values. After update the global best position of the population and the local best position of each individual. Iteration times; if equals or the solution satisfies accuracy requirement, CSO outputs the final result; else, go to Step 3.

After ANN classification, the output is fed into SVM which is selecting the features that near the kernel. Then the features have been optimized with CSO before the classification for selecting the feasible solution to the classification of lung diseases. Therefore the proposed HRBPNNCSO model is one of the best models to classifying the chest X-Ray dataset for identifying the lung diseases with higher accuracy.

#### 4. RESULTS AND DISCUSSION

After pre-processing of chest X-ray image the segmentation algorithm has been applied for segmenting the left and right side of the lungs. Here the final segmentation results for lung cancer and pneumonia of chest X-ray has been shown in figure4.

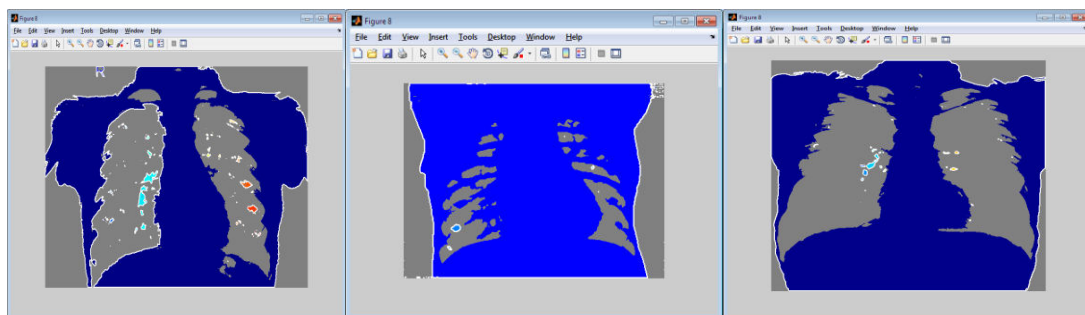


Figure 4. (a) Normal (b) Pneumonia (c) Cancer

The final phase is classification which is implemented by using HRBPNNCSO algorithm for classifying lung diseases as lung cancer, pneumonia and normal images. The classification result obtained by using HRBPNNCSO is given in figure5. Then the CSO optimization has shown as histogram diagram in figure6.

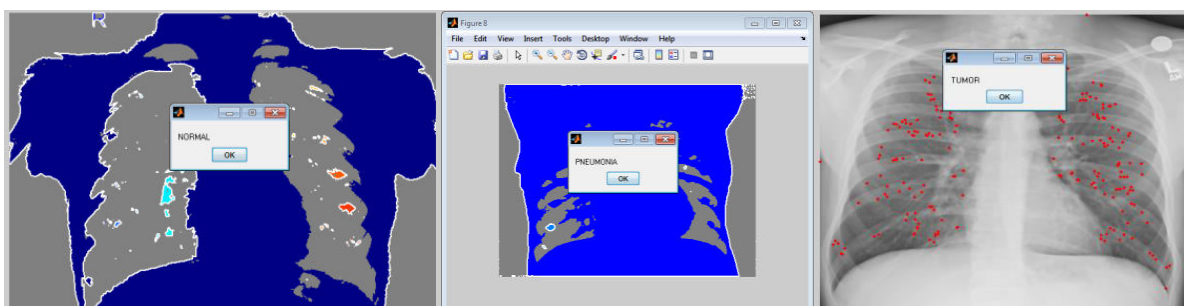
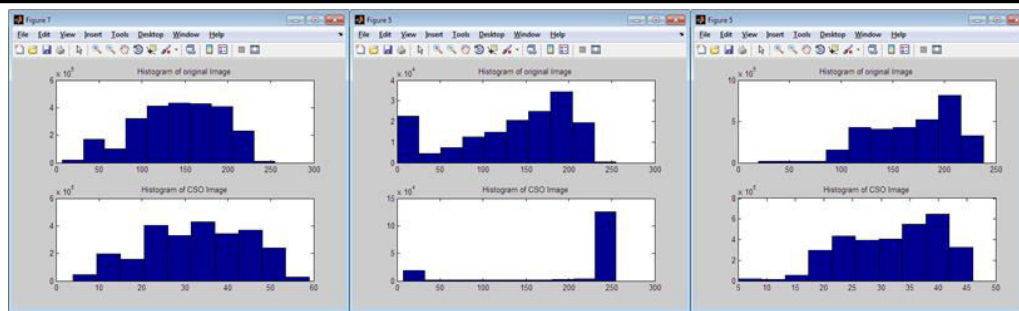


Figure 5. (a) Normal (b) Pneumonia classification (c) Cancer classification





**Figure 6.** (a)CSO Normal (b) CSO Pneumonia (c) CSO Cancer

## 5. CONCLUSION

In this paper, we have proposed a novel approach for lung disease classification from chest X-Ray image as lung cancer, pneumonia and normal lungs. The proposed work based on machine learning with image processing techniques. This model considers the lung features which is used for proper image enhancements. The classification has been done by the combined feature of ANN and SVM with CSO which is defined as HRBPNNCSO method. The proposed model of machine learning classifier evaluates the performance in terms of lung disease classification accuracy, sensitivity and specificity. The accuracy of this HRBPNNCSO is 96.4%, specificity 94.85% and sensitivity 98.40%. Therefore, the combination of image processing and machine learning techniques are very efficient in classification of respiratory diseases as cancer, pneumonia and normal. The proposed model is very operative in terms of computation and early detection and diagnosis of diseases with high accuracy.

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## SAFETY AND RISK ASSESSMENT OF KOJIC ACID

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## ABSTRACT

*Like all ingredients in cosmetics have some adverse effect, kojic acid has also contain some risk factors but also have more advantages for cosmetic industry. Kojic acid is exploited for various of applications in the food, agriculture, cosmetics, pharmaceutical, and chemistry industries, but the cosmetics industry is now exhibiting its efficacy. The aim of this study is to known about safety and risk of kojic acid (KA). Kojic acid and its derivates is performed as antioxidants, antimicrobial, anti-proliferative, radio protective and exfoliant in cosmetics products. It is used as creams, lotions, soaps and dental care products and it is suitable for topical application. Kojic acid inhibit the melanin production. It improves the uniformity of the skin tone in the treated regions by preventing the formation of melanin. As a result, dark and spotted skin patches gradually fade until they mix with the surrounding skin. KA may also be designed as a chemo sensitizer to improve the effectiveness of commercial fungicides or antifungal medications. Acute, long-term, reproductive, and genotoxicity investigations revealed that kojic acid was not toxic. Kojic acid is slowly taken into the circulation from human skin and is unlikely to reach the threshold at which these effects were recognised. This is true some animal evidence discovered modest carcinogenicity and tumour promotion of kojic acid but the kojic acid-based nano-carrier system exhibits efficient anti-cancer medication delivery, greatly inhibits cell proliferation, and also slows tumour growth. Nanotechnology based drug delivery system modulate drug penetration to the skin and enhance the efficacy of the drug. The FDA banned the use of KA in pharmaceutical field without prescription but the cosmetic ingredient Review (CIR) Expert panel approved it because according to clinical trial, a formulation containing 1% kojic acid has been proven to be successful in treating hyperpigmentary conditions like melasma, post-inflammatory hyperpigmentation, age spots, and freckles.*

*Keywords: Kojic acid, Nanoparticles, Safety assessment, Trade name and use*

## 1. INTRODUCTION

Skin is the largest organ of the body which protects and prevents the loss of water from the body. The dermis underneath the skin's surface and the epidermis above it make up the skin. The hypodermis is located underneath the dermis. But sometimes skin conditions and its colour are worst due to sun burn, pigmentation etc. Skin brighteners are a category of therapy techniques that can be used to treat skin conditions brought on by hyperpigmentation. They might stop the production of melanin. A pigment called melanin is created within the melanocytes. (1,2) They are produced in a complicated process from tyrosine in the presence of tyrosinase, and after being packaged in melanosomes, they move to keratinocytes, which are the primary epidermal cells. Skin hyperpigmentation develops when these pigment outputs are greater than normal or when their distribution is abnormal. Whitening of the skin is the process of using chemical treatments to lessen skin hyperpigmentation through a variety of processes, including as lowering the concentration of melanin. One of the most popular procedures today to address the hyperpigmented areas of the skin is skin brightening. One of the most widely used lighteners in cosmetic goods, Kojic acid and its derivatives work by preventing melanocytes from producing pigment(3–6)

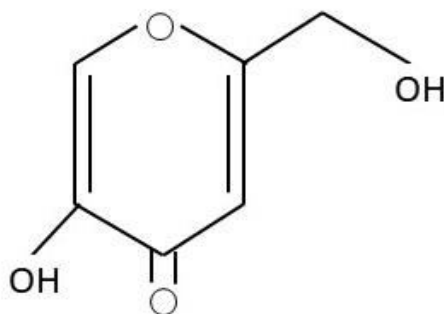
Kojic acid (KA) is a metabolite produced by different *Aspergillus* and *Penicillium* fungal species and it was first informed as a crystalline constituent from the mycelia of *Aspergillus oryzae* grown on steamed rice. In 1988, KA was initially used in Japan to lighten skin. The tyrosinase enzyme, which causes skin hyperpigmentation, is inhibited in action by this substance(7–9)

## 2. PROPERTIES OF KOJIC ACID

A secondary metabolite called kojic acid is often produced by numerous species of "filamentous fungus" (e.g., *Aspergillus* and *Penicillium*). Because of its characteristics, which include its inhibitory effect on tyrosinase activity and melanogenesis, it is frequently used in cosmetics with the following primary purposes: skin-lightening agent, Depigmenting substance and Skin-whitening agent.

The Kojic acid structure is crucial in determining the chemical and physical characteristics it exhibits.

Figure.1 Kojic Acid



### 2.1. Physical Properties: (10)

The physical property of the kojic acid is most important to known for formulation. So, all the physical property is mentioned in Table 1.

Table 1. Physical property of Kojic acid

Molecular Formula	C <sub>6</sub> H <sub>6</sub> O <sub>4</sub>
Boiling Point	401.7±45.0°C at 760mmHg
Melting Point	152 - 155°C
Density	1.5±0.1 g/cm <sup>3</sup>
Storage condition	Refrigerator
Water solubility	Soluble
Stability	Stable. Combustible. Incompatible with strong oxidizing agents.
Vapour pressure	0.0±2.1 mmHg at 25°C

### 2.2. Chemical Properties: (11)

- It is dispersible in water, ethanol, ethyl acetate, and other polar compounds. On the other hand, very little kojic acid can be dissolved in substances like ether and chloroform.
- Kojic acid is characterised as having a weakly acidic polyfunctional active quinone-pyrone because it is reactive at every location on the ring.
- Hydroxyl (OH-) serves as a weak acid in the carbon-5 position and can form salts with small amounts of metal, such as sodium, zinc, copper, etc., making it more hydrophilic(12)

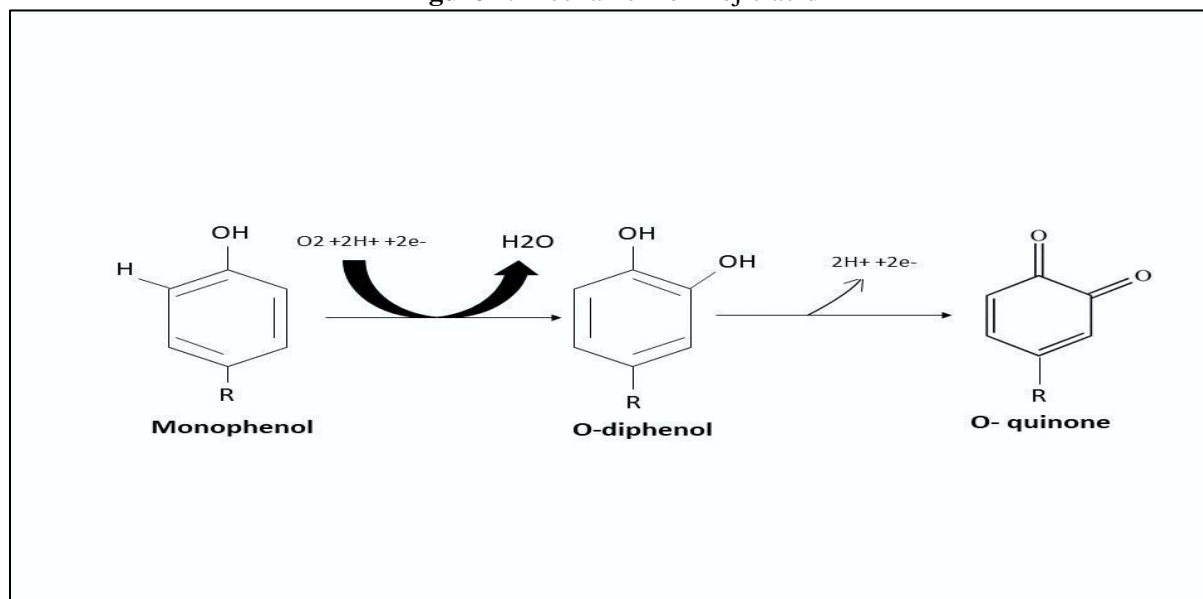
### 3. KOJIC ACID DERIVATIVES:

Kojic acid is less frequently used in cosmetic goods because it irritates the skin, has little inhibitory effect, and is unstable during storage. Many Kojic acid derivatives have been created as a means of overcoming these drawbacks. To increase stability and solubility, these compounds were created. It is possible to transform Kojic acid into an ester, glycoside, amino acid derivatives, hydroxyphenyl ether, or tripeptide derivatives by altering its alcoholic hydroxyl group. About eight times as potent as KA at inhibiting tyrosinase activity is the Kojic acid derivatized through an ethylene bond of the phosphonate with aldehyde using intermediates derived from Kojic acid. Methods for the synthesis of several Kojic acid derivatives, including Kojic acid, d-palmitate, Kojic acid ester and Kojic acid laureate, have recently been published. As powerful tyrosinase inhibitors, Kojic acid peptides have also been studied(13).

Cosmetic formulation for application to the skin contains kojic acid ester and an aliphatic carboxylic acid. The skin can be whitened effectively by the kojic acid ester, and it also works wonders against sun damage (14). As tested on -MSH-induced B16F1 melanoma cells, Kojic acid esters, which are produced by esterifying Kojic acid and palm oil-based fatty acids, have been shown to be safe and nontoxic depigmenting agents with a satisfactory inhibitory effect on melanin synthesis and tyrosinase activity(15).

### 4. MECHANISM OF ACTION:

Kojic acid is a type of secondary metabolite whose biosynthesis pathway is still unknown. As a tyrosinase inhibitor and free radical scavenger, it is claimed that it chelates divalent ions. The tyrosinase enzyme's active site is where it acts by chelating copper (Cu<sup>+</sup>). Tyrosinase, also known as polyphenol oxidase, is an enzyme that transforms L-tyrosine into L-3-4 dihydroxyphenylalanine and regulates the pace of melanin formation. With two copper ions (CuA and CuB) at the active site, it is a member of the type 3 copper-containing protein family. CuA and CuB catalyse the oxidation of o-diphenols to produce the o-quinone derivatives by first converting monophenols (such as tyrosine) into o-diphenols (diphenolase activity)(5).

**Figure 2.** Mechanism of Kojic acid

## 6. SAFETY ASSESSMENT OF KOJIC ACID:

The use of Kojic acid as a cosmetic component is prohibited in several nations, including Switzerland, and it is listed as a "additive" in the Inventory of Cosmetic Ingredients database of Europe. Additional studies on skin sensitivity have further supported the safety of KA at a dosage of 2% in leave-on(16)

Acute, long-term, reproductive, and genotoxicity investigations revealed that kojic acid was not toxic. While some animal studies revealed modest carcinogenicity and tumour promotion, kojic acid is slowly absorbed into the bloodstream from human skin and is unlikely to reach the concentrations required to cause these effects. Kojic acid depigmented black guinea pig skin at a concentration of 4%, but not at a concentration of 1% (17) Bearberry leaf-derived KA is secure and effective for topical application; however, it is not sufficiently stable and effective for cosmeceutical use(18,19).

Further, a survey of the cosmetics industry revealed that it is safe to use at concentrations between (0.1 and 2.0) % (18). Dermal sensitization and skin lightening would not be observed at use concentrations below 1 percent, according to the Cosmetic Component Review (CIR) Expert Panel's findings; as a result, this ingredient is safe for use in cosmetic products up to that level(17) .

Based on in vivo investigations on the genetic toxicity of animals, the International Agency for Research on Cancer classified KA as a group 3 carcinogen(19) The FDA also prohibits the use of KA in pharmaceutical items without a prescription; however, the SCCP noted that the dose of KA should be 1.0 percent in skincare products(5).

Shah et al. studied that pre storage kojic acid delay the pericarp browning and maintains antioxidant activity by taken the Litchi fruit with 2,4, or 6 mmol/L KA and stored at  $5 \pm 1^\circ C$  with  $90 \pm 5\%$  relative humidity for 20 d. Fruit handled with 4 mmol L-1 KA showed less weight loss and deterioration, whereas fruit treated with 6 mmol L-1 KA took longer to brown because it maintained higher levels of total anthocyanin and phenolic compounds as well as 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity. pre-storage Exogenous KA (4 and 6 mmol L1) administration postponed pericarp browning, decreased malondialdehyde levels, Hydrogen peroxide radical production, and polyphenol oxidase and peroxidase activities. Fruit exposed to KA preserved larger levels of anthocyanins (20)

## 7. APPLICATION OF KOJIC ACID IN COSMETICS

Economically Kojic acid is used in various field like in agriculture, food industry, chemical industry, medicine and cosmetics. But now days KA is basically used rapidly in cosmetics industry in which it used in skin care treatment. Kojic acid is a tyrosinase inhibitor that occurs naturally and has been successfully utilised to cure skin hyperpigmentation which is used to inhibit melanin formation(21)

Kojic acid and its derivatives may provide the pharmaceutical and cosmetic industries a promising supply of anti-inflammatory compounds. Liu et al. studied that, From the fungus *Aspergillus versicolor*, two derivatives of kojic acid known as kojicon A and B were formed. These compounds were later identified as kojic acid adducts with tricycle-skeletoned cyclohexen-1,3-diones. Additionally, both in vitro and in vivo studies showed



that they have strong anti-inflammatory effects. The findings indicated that kojic acid and its derivatives might represent a promising source for the creation of anti-inflammatory drugs for the cosmetics industry(22)

Kojic acid is used as radio protectant and also as a uv protector. KA could be a auspicious new radioprotective agent because it appears to have significant protective properties against radiation-induced damage. Higher levels of radical scavenging activity are produced by kojic acid (23).The effects of kojic acid include anti-aging, anti-mycobacterial, anti-tyrosinase, and anti-dermatophytic properties (24,25)



#### 8. CASE STUDIES OF KOJIC ACID:

54 patients with hyperpigmentation received topical applications of a lotion containing 1% kojic acid twice daily. Each patient was a woman. They ranged in age from 18 to 78 years old. Chloasma affected fifty cases, along with two cases of post-inflammatory hyperpigmentation, one case of hyperpigmentation following sunburn, and one case of hyperpigmentation on the hands. In 27 cases, the application period was less than one year; in 20, it ranged from one to five years; and in 5, it exceeded five years. In 18.5% and 59.3% of patients, respectively, marked and moderate improvement was attained. Only 1.85% of cases had negative effects. According to effectiveness and side effects, the usefulness rate was 75.9 percent. The typical length of time for a study to take effect was 3.7 months. These findings imply that kojic acid cream is effective in treating hyperpigmentation, including chloasma.

#### 9. DRUG DELIVERY USING KOJIC ACID LOADED NANOPARTICLES:

A cosmetic formulation that contains active chemicals or other nanostructured materials and has better performance characteristics than traditional cosmetics is referred to as a Nano-cosmetic(26). Nanotechnology has been significant in the field of cosmeceuticals. They have been at the basis of countless discoveries, opening up new options for the future of the cosmeceutical sector, using new techniques to alter matter at an atomic or molecular level(27). The major benefits of using nanoparticles in cosmeceuticals include excellent stability of cosmetic ingredients through encapsulation within the nanoparticles; effective protection of the skin from harmful ultraviolet (UV) rays; aesthetically pleasing products (for example, using smaller particles of active mineral in mineral sunscreens allows them to be applied without leaving a noticeable white cast); targeting of active ingredient to the desired site; and controlled release of the active ingredient(26,28). It is well known that cosmetic items are applied to unhealthy skin even though they are intended to be used on normal skin. Skin's natural barriers may not function as well under these circumstances. The majority of the research indicated that skin-applied nanoproducts only partially penetrated beneath the stratum corneum and through skin pores and hair follicle openings(29). There are several researches done to prove the advantages of the encapsulated nanoparticles.

The purpose of the study by **Mohammad et al.** was to assess solid lipid nanoparticles (SLNs) as a drug delivery platform for the topical administration of Kojic acid dipalmitate (KAD). Five different lipids were used to create the SLNs formulation, and it was homogenised. Then, Franz cells were used to assess the release and penetration profiles of KAD cream, KAD hydrogel, SLN-based KAD cream, and SLN-based KAD hydrogel on rat skin. The fastest release was from KAD powder, and the slowest release was from the KAD hydrogel based on SLN. The stratum corneum contained the highest concentration of KAD loaded in SLN, while the epidermis contained the highest concentration of KAD loaded in hydrogel formulation. With a particle size of around 100 nm and a fair entrapment efficiency, KAD can be loaded in the SLN. When compared to other formulations, KAD loaded in SLN-based cream produced the highest concentration of KAD in the epidermis(30).

The effects of KA as a skin-whitening and topical anti-inflammatory drug with significant tyrosinase inhibitory activity on skin pigmentation problems with the help of polymers were described by **Faig et al.** (31).

**Khezri et al.** investigated that the Kojic acid solid-lipid nanoparticles (KA-SLN) dispersion can improve the dermal delivery of KA by boosting the concentration and controlling the release into deeper layers of the skin. Due to their simpler cellular absorption, the inclusion of lipid components in KA-SLN dispersion carriers seems to have the potential to enhance the efficacy of cosmetic and medicinal preparations. These components can also be employed to create a promising and novel cosmetic product that may provide new therapeutic alternatives for hyperpigmentation problems.(32) .

**Yun et al.** studied nano emulsion formulation which contain kojic acid. In this study, the oil-in-water (O/W) KA nano emulsion was created by combining hot temperature inversion and integrated low and high energy approaches. The lack of phase separation during experiments involving centrifugation, freeze-thaw cycles, and storage temperatures of 2 and 25 °C, with the exception of the three-week extended storage at 37 °C, demonstrated the nano emulsions' kinetic stability. The combined findings demonstrated that the O/W KA nano emulsion formulation is appropriate for topical administration to human skin (33).

#### 10. TECHNICAL AND TRADE NAME OF KA:

**Table.2** Technical and trade name of kojic acid

Trade Name	Combinations	Treatment	Type	Manufacturer	Reference
Clearz	Kojic Acid 0.75% w/w + Vitamin C 2.5% w/w	Melasma	cream	Dr. Reddy's Laboratories	(34)
Demelan	Kojic Acid 2% + Glycolic Acid 5% + Arbutin 10%	Hyperpigmentation	cream	Glenmark Pharmaceuticals Ltd. (Gracewell SPL)	(35,36)
Depiwhite	Hydroquinone 2% + Kojic Acid 2% + Al silicate 1% + Vitamin C 0.5% + Lactic Acid 0.2%	hyperpigmentation	cream	Wockhardt Limited (Derma)	(35,37)
Kojidis	Kojic Acid 2% w/w + Vitamin C 2.5% w/w	Protect from skin tanning and harmful UV rays	cream	Bionova	(35,38)
Medis-SLC	Arbutin 1.5% w/v+ Glycolic acid 4% w/v + Kojic acid 1% w/v + Licorice extract 1% w/v + Octyl methoxycinnamate 7.5% w/v	Hyperpigmentation, Pregnancy-induced hyperpigmentation (PIH)	Lotion	Bionova	(39,40)
Tolosoft	Allantoin 0.4 %W/W + Arbutin 1.5 %W/W +Kojic acid 2 %W/W +Niacinamide 5 %W/W + Octyl methoxycinnamate 7.5 %W/W + Pine bark extract 2 %W/W + Vitamin E 1 %W/W	Melasma	cream	Intra Life (Cutis Derma Care)	(39,41)

## 12. CONCLUSION

Kojic acid have both benefits and side effects. Long term use of kojic acid make the skin more inclined to sunburn. KA is not used in broken or damaged skin. Some countries have banned this product because of its carcinogenic property. But also, KA have antioxidant, antifungal and antimicrobial property which help the skin to fight off several common type of bacterial strain and help to treat acne caused by bacteria in skin. So, for the safety of individuals Kojic acid is used in 1% of concentration. But to prevent its carcinogenicity and identify the side-effects and make it more efficacious towards the skin further research is required.

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**LOW COST CONVERSION OF OLD HOME APPLIANCE INTO REMOTE CONTROLLABLE USING INTERNET OF THINGS**

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*In this research paper the process of converting old home appliance into remote controllable using internet of things to make a smart home without changing the existing home appliances with the help of IOT and Android application for physically challenged people. Toggling power switches of the appliance is a tedious work and time consumption for physically challenged people. However Smart applications are moreover expensive to substitute the current one. Thus, to fix these issues this paper has come up with the solution. It is expensive and takes too much time for the installation. Some of the issues like short circuit, cable break up in internal is too difficult to fix. In the proposed scheme the graphite is used as the power transmitter instead of wires with Bluetooth arranged change panel. Thus, the installation time and cost are minimized. Where the above issues are optimized. The Graphite raw material is converted into graphite paint using chemical composition of Sodium silicate and aluminum silicate. Thus, it is a water resistant and can be painted at the top or near the ceiling of our wall with two parallel lines, so we can take one line as positive and another as negative. This improves the technology to the next level of transferring electricity. So, the luxury level will get steeped up with controlling the appliances using the mobile and thus it is safety too.*

*Keywords: Internet of Things, Graphite, Arduino, Relay, MIT App Inventor.*

**1. INTRODUCTION**

The proposed research paper is to make a smart home without changing the existing home appliances with the help of IOT and Android application for physically challenged people. Toggling power switches of the appliance is a tedious work and time consumption for physically challenged people. Unfluctuating nonetheless Smart appliances are too expensive to substitute the existing one. Thus, to fix these issues this paper has come up with the solution.

In the proposed organization the graphite is used as the power transmitter instead of wires with Bluetooth configured switch board. Thus, the installation time and cost are minimized. Where the above issues are optimized.

The Graphite raw material is converted into graphite paint using chemical composition of Sodium silicate and aluminum silicate. Thus, it is a water resistant and can be painted at the top or near the ceiling of our wall with two parallel lines, so we can take one line as positive and another as negative. Normally as getting the electricity from the street transformer communicated with wire to our home. Then from there the wire connection is converted into graphite connection inside the house. Where all rooms have the graphite painted lines where the electricity can be passed easily, and the lines are get covered with the shield or cord covers to prevent humans from touching it in direct hands.

The switch board (Main junction box) also fixed near to the ceiling graphite line with Bluetooth configuration and the plug points are get lined down to the normal height level of side wall for the usage of charging, etc.

Where all the other necessary home appliances (light, fan, television) are get communicated with graphite line connection as preinstalled. Using the mobile application connected via Bluetooth we can able to on and off the lights, fan, and control other home appliances.

**2. LITERATURE REVIEW**

Francis M. J Proposed the main influences in smart home vigor organization comprise well-organized home appliance project, better client consciousness, contribution in DSM agendas, and the usage of an EMS.

D. A. Flores, O. Angelopoulos, and R. J Proposed With admiration to appliance project, in [5], the authors experiential the regular energy competence of applications is beneath best repetition levels meanwhile of postponements in replacement big, less-efficient microchip technology by novel efficient microchip technology and since clienteles bomb to recall energy ingesting when buying an application. In [6], stricter values are optional to recover competence, but clienteles motionless production the main role in vigor upkeep.

E. Brockner. Ecuador Proposed Smart rhythms are therefore vital, and are today working in greatest Canadian households for measurement period ingesting; though, clienteles may not be conscious of how abundant energy

a watt signifies. Clarifying this idea for the client needs that the cost be if in equal dollars, but even with the KWh worth sent on the power breadwinner's site, non all customers often path their real ingesting.

Anna Simonova Proposed energy competence is connected to subjects outside ingesting finished smart devices, such by way of space boiler, which is reliant on on the part of the lodgings and the homebased, and wastes energy because of augmented warmth in parts near to the regulator; its site on the inferior floor of a household needs higher locations to warmth the rest of the house and inferior ones to calm it.

Zengan Gao and Mao Ye Proposed Customers' information of and knowledge with vigor organization is a main issue in electricity upkeep. Circumstance educations must be rummage-sale by way of a income of decisive the best system for vigor and cost organization since absence of practical info around nursing and switch schemes touches development to upkeep.

### 3. PROPOSED SYSTEM

1. The Bluetooth Module
2. Ardino UNO Board
3. Relay Channel

**Bluetooth Module:** The Bluetooth Module chunk is mostly accountable for founding the joining between The Android Smart mobile and the Circuit ended Bluetooth Channel.

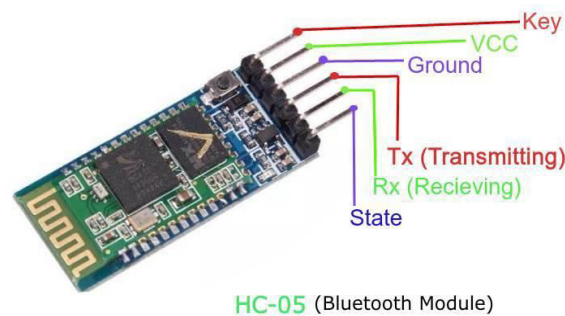


Fig 1: HC – 05

**Arduino UNO:** This panels co-ordinates all the additional computer peripheral that are linked with the circuit.

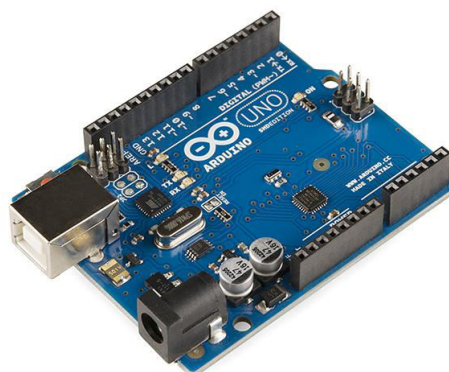


Fig 2: UNO Microcontroller

**Relay Board:** Relay board is an Attractive Change. By means of a 4-channel relay panel for this scheme to control 4 dissimilar Applications. Thus, the relay contributions and productions are connected with the plumbago lines to pass the power to the applications.



Fig 3: Relay Channel



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This paper will show how the Internet of things connect, interact and exchange data. Paper specifies the step to reduce the investment cost of smart appliance to help the physically challenged people. Instead of replacing the existing home appliance it is possible to convert them into smart appliance.

“The Internet of Things (IoT) is a scheme of unified computing plans, mechanical and numerical machineries, substances, faunae or persons that are if with unique identifiers and the aptitude to transfer information ended a network deprived of needful human-to-human or human-to-computer communication.” IoT devices are a part of the larger concept of homebased mechanization, which can comprise lighting, boiler and air conditioning, television and safety schemes.

Each and every appliance are connected to an electrical relay station. The electrical relay module is a distinct hardware expedient rummage-sale for distant expedient switching. With the state we can at all control plans over a net or the Net. Plans can be at all powered on or off with instructions coming from Microcontroller. Where there are so many types of relay channel like 4, 8 channels. Thus, the appliance power connection is directed with the help of our relay board. Relay channel is connected with the microcontroller named Arduino UNO.

Arduino is an open-source microchip skill platform founded on easy-to-use computer hardware and software. Arduino panels are talented to recite inputs - light on a device, a digit on a key, or a Twitter communication - and go it hooked on a production - actuating a motorized, rotating on an LED, publication somewhat connected. Container tell your board what to fix by distribution a set of orders to the microcontroller on the panel. To do use the Arduino software design language (based on Wiring), and the Arduino Software (IDE), based on Dispensation.

Arduino Uno panel is armed with the Bluetooth unit (HC-05) unit is an easy-to-use Bluetooth SPP (Serial Port Protocol) unit, intended for see-through radio serial connection arrangement. Serial port Bluetooth unit is fully fit Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Inflection with whole 2.4GHz radio transceiver and baseband. Which helps the microcontroller to direct and obtain orders over moveable.

The work flows in the format as the expedient contain of relay channels connected with the power supply of appliances and the relay board controlled with the help of Arduino microcontroller with Bluetooth module is molded as a junction box inside the house. The robot request can able to communicate with the microcontroller via Bluetooth locally then via normal SMS from remote areas.

Basic android mobile with Bluetooth is enough for the application requirement thus there is no need of high-end mobile with IR blaster and so on. The application helps the physically challenged people in the following ways where Foot disorder people often invest in expensive wheel chairs, even though it is not useful that much for them. Thus, our mobile application helps them by a great GUI in mobile application. For Hand and eye disorder people the application helps with the voice listener to control the appliances.

The Internet of Medical Things (too named the internet of health things) is a request of the IoT for medical and health connected drives, data group and analysis for research, and nursing. This 'Smart Healthcare' as its container also be named, led to the formation of a digitalized healthcare scheme, linking available medicinal capitals and health care facilities.

The request is constructed with the assistance of App Inventor for Android, is an open-source mesh request originally if by Google, and now upheld by the Massachusetts Institute of Technology (MIT). Its usages a graphical border, very alike to Cut and the Star Logo TNG user border, which lets users to drag-and-drop visual substances to make a request that container run on Android plans. In making App Inventor, Google sketched upon significant prior investigate in educational calculation, as healthy as effort done within Google on connected growth surroundings. Its assistances with the moveable devices like nearness device, voice hearer, jiggle sensor, timer, and site.

Where the old appliances are get converted into smart appliances with the cost-efficient method. The android mobile can be communicated via Bluetooth inside the house to toggle the light, fan, water pump, etc. When it comes to remote location the micro-controller and the mobile device is left at the home itself. Even though we can able to control the home appliances with the third-party mobile using the SMS. By sending an SMS like “Turn on Light” to the device mobile the message gets communicated with the microcontroller and the action of light gets on is done successfully. Physically challenged people can able to maintain the garden at time even in far location. Using the android application, the timer for each appliance can be controlled like at the early morning the fan needs to be turned off automatically.

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**5. CONCLUSION**

The proposed research paper will make a smart home without changing the existing home appliances with the help of IOT and Android application for physically challenged people. Toggling power switches of the appliance is a tedious work and time consumption for physically challenged people. Even though Smart appliances are too costly to replace the existing one. Thus, to fix these issues this paper has come up with the above solution. The claim of the IOT in health care theatres an important part in handling Remote nursing is made likely finished the joining of influential wireless answers. The connectivity allows well-being doctors to capture patient's information and smearing multifaceted procedures in well-being information examination.

Thus, using this system physically challenged people can able to control their old home appliances in a smart way. Where the Internet of things plays the helpful role with respect to healthcare applications.

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**IMPACT OF MOBILE-BASED TECHNOLOGY ON LIBRARY SERVICES**

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Tamilnadu, India**ABSTRACT**

*Recent year's rapidly developing technology. We are in the so called "Age of Smart Phones and Tablets. Smart phones have taken a vital role in everyone's life. One could have difficulty in recalling days when life was without phones. Mobile computing presents a golden opportunity library to provide services and connect with users anywhere and anytime, Anytime, anywhere, any device - our Library on your Mobile Phone. This study focused on mobile-based library services, it covered advanced wireless network technology, mobile devices used in libraries, mobile-based library services, advantages, requirements and implementation of library, M-OPAC.*

**INTRODUCTION**

The term "mobile library" refers to library services and resources that are accessible around the clock on any device, not a bookmobile that moves between sites. Applications, often known as apps, are a new technology that has an impact on libraries. Users can browse and search library materials using mobile devices. Users don't have to wait. To reserve or renew books at the library's transaction desk, saving the user's time. A unique and tailored service that promotes library interaction is the mobile library service.

**IMPLEMENTING MOBILE-BASED LIBRARY SERVICES**

To understand the practical circumstances, such as the types of services to be offered on mobile devices and the kinds of devices to be used, in-depth requirement analysis is required. The library must purchase the necessary hardware and software after conducting a market analysis. The use of mobile devices and accessories requires a physical and virtual environment from the library.

Customers with mobile phones from various network operators must be able to access the services, so this must be ensured. Before launching new services, libraries must optimize their online catalogue, websites, and databases for mobile use.

Because web information is available via mobile services around-the-clock, security and authentication are issues that need to be addressed to prevent data loss or damage.

To look for books, patrons must now go to a library and use a manual kardex or an OPAC terminal. OPAC - Book Search through the internet is only available in a very small number of libraries. Additionally, customers only get access to the data of the one library where they have registered. Therefore, there isn't a single platform where all libraries globally may share their information with users and a global search engine enabling users to look for books from all over the world.

Today's students demand instantaneous, easy access to information about materials in the library via their mobile devices. In addition to other things, they desire mobile access to library systems. To fulfill these expectations, M-OPAC of mobile upgrades are specially created to meet the particular needs of patrons, students, and libraries.

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In the world of educational technology, Maser Soft is a well-known company. Our team creates an ERP e-governance solution for all kinds of educational institutions while working under the direction of top industry professionals. Additionally, we developed a better tool for library management. Customers can conduct online book searches thanks to a library management programmer built by Master Soft.

M-OPAC is a book search app for smartphones that provides all libraries in the world with an affordable cloud-based platform to share book data. All patrons worldwide can get easy access to free book searches.

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**WIRELESS NETWORK TECHNOLOGY**

The majority of academic libraries in India still use cabled computer networks more frequently than wireless broadband networks, even though wireless network technology has undergone a lot of advancements in wireless, mobile, internet, and web technologies.

It may take some time for the emerging wireless, mobile, and internet technologies to make an impact in university libraries. Digital cameras, laptops, mobile phones, personal computers, printers, scanners, and other devices can communicate wirelessly at high bandwidth within a short distance thanks to the new technology known as Bluetooth. Wide area wireless cellular telephone networks are intended for use with 3G telecommunication, or third-generation wireless communication technology. Rapid processing is possible for music, graphics, video, etc.

Mary List Titcomb created the country's first bookmobile (1857-1932).

When Titcomb was working at the Washington County, Maryland Free Library, he worried that the library wasn't reaching all of the potential patrons. To create a book wagon, she worked on a plan.

The first book wagon in the country was made available to inhabitants of rural areas of the county in 1905 by the Washington County Free Library, which delivered the books right to their homes. In the 1950s, the Gerstenslager firm specialized in producing mobile libraries and related vehicles.

**Mobile Devices Used in Libraries, Version 4.0**

- PDAs, smartphones, and other personal digital assistants
- Cellular device.
- Apple's iPods and MP3 devices
- In tablets
- Mobile device and service design

**M- Library-Based Services**

M-Libraries present a chance for the transfer of current library-based services to the mobile environment. Two mobile library services, including the Library Catalogue, and Loans & Reservations Service, are planned for implementation within this framework. The Interactive Library Map Service. The Recommendations Service. These services give patrons more effective access to materials and information as they are moving about the library.

**Services**

Mobile Library Site

MOPAC – Mobile Version OPAC

Circulation Services

Reference Enquiry Services

CAS & SDI

Distribution of e-Resources

SMS Alert Services

Library Maps and Floor Plans

Library News, Events and Blogs

Mobile Databases

List of New Arrivals

Inter Library Loan Service

Books and Articles Search

Library Hours and Library Tours

**Mobile Libraries and Technology**

There is no indication that the widespread use of mobile devices in society will shift.

Most people who use the library these days have smartphones, which they use for both personal and professional purposes. The "Libraries in Hand" trend in libraries has now been created by mobile technology.

The impact of these gadgets on information access is being studied by librarians, who also want to make sure they are connecting with users and delivering Web content in the most suitable and efficient ways possible.

To enhance the market and demand for mobile access to individualized facts and information anytime, anyplace on one's portable device, librarians are utilizing mobile technology.

## **ADVANTAGES**

### **Time Savings**

Users can save time by not having to record information about resources while browsing and searching the library's materials or waiting in line at the circulation desk to renew or reserve books.

### **User Involvement**

Libraries can improve OPAC by allowing users to add notes or photographs that they have submitted themselves.

### **Location Awareness**

Through the use of GPS, mobile communication enables libraries to provide location-based services and materials.

Through maps and navigational aids, libraries can direct visitors to the location of a given document or service.

### **Unlimited Access**

All online resources that users can access on their desktop also become available on their mobile devices.

### **Accesses to Print-Incompatible Users**

Mobile communications assist in giving services verbally to users who are blind or physically challenged. Require a minimum amount of physical space and manpower to operate.

## **CONCLUSION**

The application of mobile technology in library services is the need of the hour. Interaction with the user community can be achieved (enhanced) due to advancements in mobile technology. Now students can access a wide range of digital resources and library services and truly engage in learning activities using any mobile devices wherever and whenever they choose, not just on their desktop PCs. The impact of mobile technology implementation raised strong awareness amongst library staff for the need to acquire skills to realize the associated benefits. Academic institutions are marketing their product and services through mobile devices. The challenge of academic libraries is to create compelling information services and to make digital content available in a way that the user community will find not only acceptable but tailored to their needs. The mobile revolution offers both challenges and opportunities for academic libraries.

The current trend is toward the integration of mobile technologies into library services. Due to improvements in mobile technology, interaction with the user community can be achieved (improved). Now, instead of being restricted to utilizing desktop computers, students can access a variety of digital resources, utilize library services, and actively participate in learning activities using any mobile device, whenever they choose. Staffs in libraries are much more conscious of the need to develop skills to reap the benefits of mobile technology implementation. Through the use of mobile devices, academic institutions sell their goods and services. Academic libraries face a challenge in developing information services that are attractive and making digital content accessible in a way that the user community will not only find useful.

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**FLOOR ART AND RITUALS OF THE DISTRICT HAZARIBAGH, INDIA**

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**Paresh Modak****ABSTRACT**

*In the district Hazaribagh of the state of Jharkhand, India's tribal people have been observed interacting with the environment to the fullest extent and caring for their animals and forest. During this festival and no festival, I spent several days working on my research article in the tribal communities of Hazaribagh. Village women create floor art during Sohrai puja on the mud floor in honor of animals, Lord Pashupati Shiv, and Lord Lakshmi just after Diwali (Kali in Hinduism). Additionally, create a new sohrai painting and ornamentation on the newly prepared mud walls. Preparation of mud walls is a long day's process, actually, after the rainy season, they repair the mud walls. This event is celebrated with the help of nature, animals, numerous traditions, and conventional beliefs. On these festival days, female singers perform a variety of tunes. They make special meals on this day of the festival and prepare color material for the floor art using rice dust, which is used as a pure hue for the floor and in prayer. That floor art or design called Aripa is long in size and geometric shapes are visible in the design. Their cattle will enter from outside to the cowshed on this design only. Prepare a different dish by combining various seeds for their livestock and humans to consume as a Prasad (divine food). There are legends about this worship of cattle. The primary source of income for the villagers is agriculture, and animal husbandry is the only source of riches for them, from their ancestors they have worshipped and revered animals. They sing the songs for offering thanks to cattle and mention that due to the cattle they are healthy and wealthy. The paintings on the walls and all the symbols are very much similar to primitive cave paintings of the Mesolithic period in Hazaribagh. Now, these days villagers design paintings on paper and daily utensils to easily sell and spread to the global platform.*

*Keywords: Rangoli, Sohrai, Art, Pashupati, Aripa, Cattle, Cowshed, Jharkhand.*

**INTRODUCTION**

In the hilly and forested state of Jharkhand, everyone is surrounded by nature. It is located in India's eastern region and is rich in natural resources. Here, there are frequent, heavy downpours and chilly temperatures. Dark forests closely touch tribal communities. Their routines and everyday activities revolve around people, animals, and the natural world. Mesolithic is thought to have been the period because of the abundance of rock shelters and the abundance of rudimentary artwork as per the archeology department. Because of everyday activity, technology, industrial expansion, and artificial growth, urban dwellers are extremely worn out. Due to my research tasks, I had been closely observing them for several days. The sohrai puja in an auspicious manner and with respect for cattle, sohrai paintings are too pure and natural, and this adds to their allure for onlookers. The tribal people of Jharkhand have long been impacted by their ancestors and by unbroken aspects of their way of life in terms of art and culture. Art and artists are always influenced by nature and society. The world's oldest human activity is art. India is renowned for the variety of its languages and cultures. Each state has its folk or tribal art form as well as rituals. Every ritual has its own set of principles, which are influenced by both nature and the evolution of mankind. People create art on the ground and practice it using their highly evolved brains.

Floor art or rangoli is an art form that takes a lot of skill and effort to develop. It has been going on since before. I've observed both urban and rural folks creating with the aid of technology and synthetic colors as well as using natural resources. Children are learning from their early years, mostly thanks to a mother in a Hindu household. Due to the impact of urban culture and the usage of electronic music systems, young people today will forget things other than how to play natural and traditional instruments. But it's fortunate that they recognized the worth of Sohrai and Kohvar's traditional culture and were able to capitalize on it. To make it auspicious, this gorgeous floor art is called Aripa, this design is typically found at the entry and prayer area. This puja's history is filled with tales of people, animals, and Lord Pashupati. For women who work from home, the traditional rangoli-making poses are a form of exercise that helps stretch the spine. It is a kind of greeting and auspicious Lakshmi to bring joy, prosperity, and optimism into the house. Geometric forms and nature both directly impacted the design. Sohrai festival created bonds between people and established norms, restrictions, and feelings of satisfaction.

Aripa (Fig. 1) is a different style from other Rangolis. On a certain surface, it usually takes the shape of a circle or square. The outdoor entry and the cow shed serve as Aripa's starting and finishing sites, respectively. Two triangle shapes (chowk) can be seen at Aripa's beginning and end, and in the remaining part of the work, a pattern resembling Churchura grass (which is required for sohrai puja) can be seen (Fig.1) (Fig. 2) (Fig.3). Three lines link each of the designs. When done, it will resemble a ground-level creeping plant. Make the



bottom of the cow poop solid, and then decorate it with flowers. Put Churchura and Dubba grass there next (this grass looks strong and the top is always hanging towards the bottom). Some people think that Lord Lakshmi hangs in their home and that Churchura grass traps money. It is essential to Lakshmi puja; hence, it is situated in the forest.



Three lines, Churchura and Dubba Grass, Flowers and Cow Dung, Triangle Shape Chowk

**Fig. 1:** Aripa (Rangoli of Sohrai) original work of Sajo Devi.



**Fig. 2:** Churchura and other decorative materials and making Aripa





**Fig.3:** Village girl arranging flowers for Aripa and painting on the back wall.



**Fig.4:** The cow is walking on the Aripa to the cow shade

#### METHOD AND MATERIALS

Farming keeps the male family members occupied; therefore only women are responsible for the upkeep of the entire house. All of the house's walls need to be repaired using clay from the agricultural area outside of the community after the wet season. Remove every broken piece from the floor, clean the area, and then add cow dung. In this manner, the floor hardens and becomes sterile and clean. Utilize a traditional Dekhi (Traditional Grinder) to grind rice into dust on the auspicious day of Sohrai; use some of the dust for a meal and the remainder as a liquid to create Aripa (Rangoli). They must make Aripa on the floor using a liquid made of rice dust that resembles a natural white tint. To produce the drawing of Aripa, first, dip the palm into the liquid, and then apply it with three fingers using drips of the liquid combination on the floor (Fig.2). To produce a single form, all activities used three lines that were repeated three times. Numerous variations have evolved from the livestock shed's outside door. They cook many grains of Prasad (a holy dish) on the same day and earlier that day they finished painting for the Sohrai puja (Fig.3).

**Sohrai Puja:** It is the most significant tribal celebration in Jharkhand and the last harvest festival before winter. Typically, it is observed at harvest, which occurs at the start of winter after the paddy has been prepared. Time is the first day of the Bengali month of Kartik, which in English corresponds to the festivals of Diwali and Kali puja. In January, several Santhal areas commemorate (around the end of the Bengali month of Poush). They express gratitude to their gods, ancestors, and animals for their harvest. This benefits wealth and agriculture. According to folklore, the name Sohrai derives from the Palaeolithic term soro, which means "to drive with a stick" and "respect for cattle."

Several rituals go along with the sohrai puja, which is performed throughout the festival's five or nine days; the timing varies depending on the community. The date will be chosen by the community elder or leader. During these celebration days, there is a massive consumption of handia (alcohol) homemade, dancing, and various songs throughout the days.

The locals clean their bodies in the water of any river or water dam before taking the animals out to graze in the morning to provide them with fresh green grass. When they come home in the evening, they use Kujri oil a forest remedy to coat their bodies to prevent skin desiccation. That procedure will continue until Diwali (kali puja) when every part of the house will be lit with a unique large-size earthen lamp in the evening. in the kitchen of Tulsi Mancha's cow stable. During this festival, several songs are sung at home to thank God for providing food and money for the family, the husband, and the mother.

The song is 'Ke Chumae Dhon, Dhaan Lakshmi Ho. Ke Chumae Dhanu Gaay Ho. Maayo Chumae Dhon, Dhaan Lakshmi Ho. Bahan Chumae Dhanu Gaay Ho'

As part of the Jagran ritual, a group of young men went door-to-door across the hamlet, entertaining the locals with music, dancing, and singing while pleading for food, money, rice, and other items. It will take place at night and in the morning (the next day of Diwali). The final day is the next morning when family members bring some rice strands from their farms to be used in worship. Following the completion of the ritual, animals' horns were then raised with oil and vermillion and decorated the cow by being tethered to the same rice plants. All the people bring their cattle to an open place called Gaay Gaat where they tie their cows with a stick to play games to the sound of musical instruments like the Madol, Dhol, etc. A necklace made of rice strands is then wrapped across their foreheads. A hen will be sacrificed by the locals during the Lakshmi puja. Women, on the other hand, had already finished their Aripa on the floor and had prepared the mud wall with cow dung and painted it with natural colors. They concluded the Lakshmi puja in the cowshed and made prasada (divine food) by boiling multigrain for the animals and humans also.

## CONCLUSION

In this essay, I looked at how festivals foster moral, ethical, and life values. Respect for both their progenitor and the animal is evident here. The hamlet of Jorakath, Hazaribagh, and Jharkhand, is the focus of this research. I gathered as much information as possible from interviews and audio-visual documentaries on my own, so I may offer my thoughts and experiences in real life through this writing. Aripa is a traditional floor art, in other states of India have different names and styles. Cattles are walking on it and entered their cow shade (Fig.4). Tribal people have close ties to the natural world. In the development of Aripa and Sohrai Painting, village women are genuinely authentic and traditional painters. Malo Devi, Suja Devi, and other artists belong to the Kurmi Mahato caste. They must be inspired to develop their creative potential further, and the subsequent generation must be impacted. Rice is necessary for survival daily, and rice dust is also considered luck. Sohrai paintings were originally made for religion, but now, women are rewarded financially and publicly for their creative abilities. Research into traditional tribal music and art can be expanded.

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## FACE RECOGNITION SYSTEMS: RECENT APPROACHES AND ISSUES

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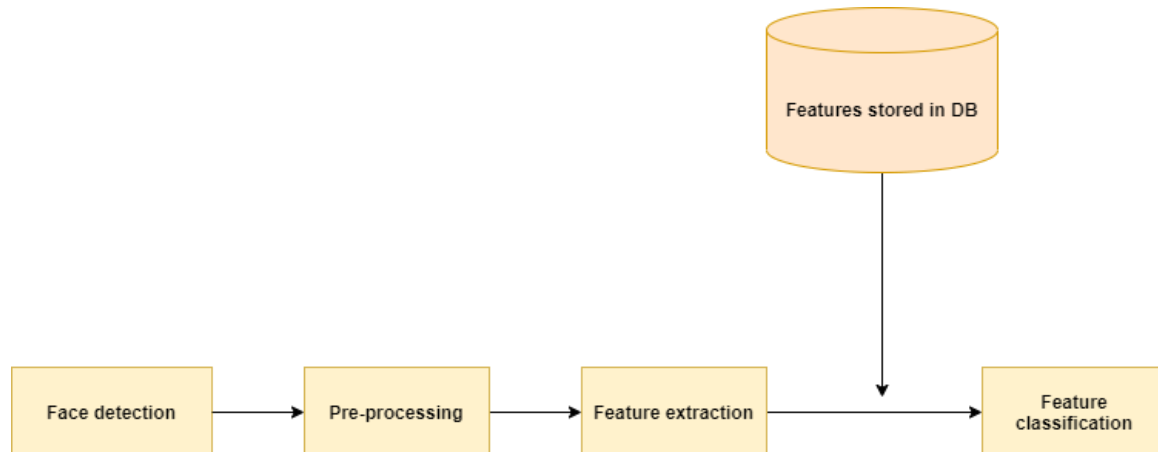
**ABSTRACT**

Face Recognition is one of the most efficient techniques of Biometric System. Various Biometric systems such as iris, ears, fingerprint, retina eye scan, voice, palm, etc have been in race of technological advancement earlier but as Face Recognition came into existence, it has proved to very effective among all. Due to this reason, many researchers in industries and academics have come up with various Face Recognition system techniques and this area is among the fastest growing research area among the researchers. The reason why this research being fastest growing is its diverse applications in different fields and different environments including unconstrained situations where other existing approaches does not work best. Such environmental situations include numerous poses, occlusion, ageing process, illumination, low resolution, plastic surgery, etc. Here, in this paper different reviews on various approaches and issues faced by face recognition techniques are presented. Also, the significant datasets of face, which consist of many facial limitations that portray real-life situations, are reviewed, as well as the flaws related with them. Additionally, researchers' recognition performance on various datasets is reported. The report comes to a close, with recommendations for future research.

**Keywords** Face recognition, Uncontrolled environment, Biometrics Techniques, Face dataset

**1. INTRODUCTION**

Face recognition system has become a hot topic in recent years due to the wide range of uses including border protection, surveillance, enforcement of law, and access control. Face Recognition has become more of multidisciplinary concern as it also includes many other applications such as psychology, neural networks. Face recognition, like other biometric technologies, goes through the same stages, as shown in Figure1 detection of face, pre-processing of the portrait of a person's face, facial features extraction, and categorization of features.



**Figure 1:** - Flow diagram showing face recognition process stages

Face detection is the first step, and it entails the device scanning a photograph or video for the face presence. Pre-processing of the image is done once the face is recognised to extract the interest region and improve quality of image. Pre-processing type, normalization in which varied sizes of facial images are converted and mapped to the same size [26].

Another pre-processing technique is face alignment, which involves locating fiducial points such as the eyes, nose, mouth, chin. Face recognition is expected to improve as a result of this method, yet it will remain a problem and an open topic in unconstrained situations [39]. Another pre-processing technique that has received little attention in the literature is image enhancement [1].

The next step in the facial recognition system model is the feature extraction stage, which tries to reduce the number of resources needed to represent a large amount of data [27]. To remove noise and superfluous information, specified features from the face image which is original are recovered, and vector sufficient of feature which defines the face is extracted from the face image. Despite the existence of multiple feature extraction algorithms in the literature, In an unconstrained situation, selecting appropriate characteristics for various face recognition systems remains a challenge [2].

Ghiass et al. [7] provided a survey of face recognition systems that was up to date, but only for infrared face recognition. Face recognition systems were also evaluated by Goyal et al. [8], although only facial expression was shown to be a flaw in their work. Ouyang et al. discovered matching face images across domains in a survey on heterogeneous face recognition [9].

The survey's purpose is to contact both new and existing customers. The study's main contribution is to critically evaluate face recognition algorithms in a real-world scenario or in unconstrained environments, as well as to explain why more research is required [30]. It's based on the most recent state-of-the-art results from a variety of face datasets, each with its own set of constraints. We also go over some of the most modern facial recognition systems, highlighting their advantages and disadvantages, as well as why they don't operate well in an unrestricted setting [10].

## 2. FACE RECOGNITION IN UNRESTRICTED SITUATIONS

Face recognition is considered one of the most difficult biometric systems in the field of pattern recognition because of the limitations imposed by changes in the look of facial pictures [11]. Numerous face recognition algorithms have produced outstanding performance in well-controlled environments [31]. However, due to the nonstable nature of face photos, as well as in real-life scenarios where the same person's face photographs appear to be different, these approaches frequently fail [99]. Most face recognition algorithms have yet to achieve optimum recognition accuracy as a result of these issues, because the face acquisition process will endure a wide range of fluctuations [1, 4]. Lighting, position variability, emotion, cosmetic surgery, ageing, low resolution, and, most notably, occlusion is among challenges that face recognition systems face [81]. Face recognition in an open setting and face recognition in the wild are among the topics covered in this section. A full discussion of modern and diverse approaches to each topic is also included.

### 2.1 Illumination

The term "illumination" refers to how different lighting influences the appearance of a face image. As seen in Fig. 2, the shift in lighting appears to be bigger than individual differences, causing facial recognition systems to struggle when comparing photos and misclassify faces [12].

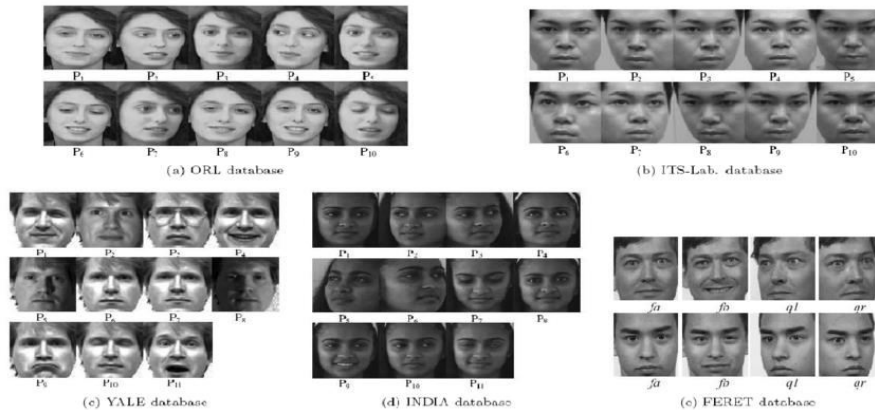


**Figure 2: Illumination Changes**

Illumination continues to obstruct the extraction of illumination invariant features, which is required for a reliable face recognition system. Changes in position, shadow form, and the reversal of contrast gradients are all consequences of illumination on an image [108]. Face recognition algorithms have a hard time achieving this goal because humans can recognise faces in a wide range of lighting situations [33]. Researchers have shown that changing the lighting conditions sides generates major visual adjustments rather than compromising the identity of the face using diverse image representations such as edge charts, grey-scale and photos filtered using the Gabor filter [58]. Furthermore, it was discovered that research and training are sensitive to variations in illumination conditions [41, 108]. As a result, facial recognition technology has failed in low-light situations, pushing academics to build a slew of algorithms to address the issue during the previous decade.

## 2.2 Pose variation

When the input photographs show posture variance, the output of a face recognition system looks to fail [34], as seen in Fig. 3.

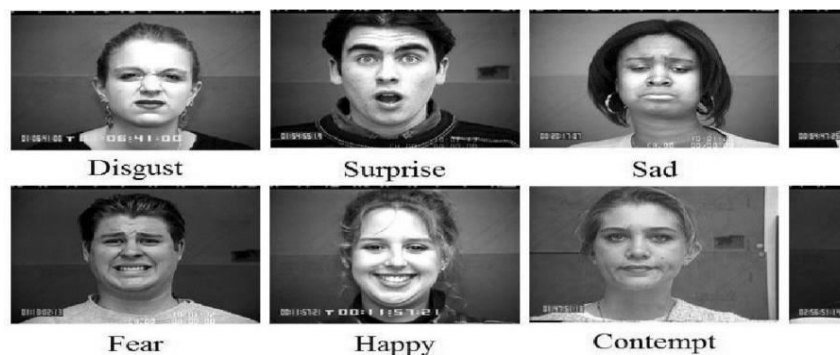


**Figure 3: - pose variation in the input images**

Face photographs are commonly taken in a dorsal view in activities such as passport control. In uncontrolled situations when face images spin and appear at varied angles, the face recognition system, on the other hand, can fail [3]. While recognising facial photos in a variety of poses is an easy operation for humans, it remains a problem for computers, in applications of surveillance especially [22]. As the frequency of terrorist acts around the world has increased, most airports now have security cameras installed. Terrorists' faces are captured and processed, then matched to real travellers' faces after they've been checked. These photos of the terrorist could have been taken in a variety of stances in the past, allowing simple face recognition algorithms to recognise him.

## 2.3 Expression

Humans may see a variety of facial expressions at all times unless the face picture is in a static mode [28]. As shown in Figure 4, these phrases are used to describe a person's varied emotions and mental states [80].



**Figure 4: - Different emotions**

Face recognition expressions are also employed in medical applications, where a certain facial expression can be linked to a particular ailment. Language accounts for 7% of the information communicated by a person, while speech accounts for 38% and facial expressions for 55% [82]. We might deduce from this that recognising a person's consciousness and mental activity through speech can provide a wealth of useful information [37]. The appearance and geometry of the face change as a result of facial emotion, reducing the efficacy of recognition. As a result, specialists are contemplating a variety of methods for resolving the issue [38].

## 2.4 Plastic Surgery

Following plastic surgery, face recognition techniques have been proven to fail to recognise people's faces. This is a condition in which a person's face image is completely changed, converting them into someone completely different [64,42]. Skin texture changes between photos of the same individual are caused by plastic surgery on the human face which makes it more difficult to recognise [2]. A common example of how cosmetic surgery can modify the appearance of the face is rhytidectomy [40]. The process in which the overall appearance of the face is entirely altered, as shown in Fig 5.



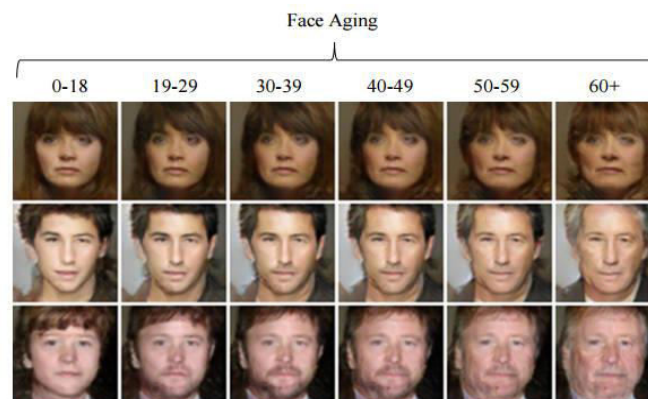


**Figure 5: - Images after plastic surgery**

This can speed up the transition from an older to a younger skin texture, resulting in a change in skin texture [43]. The basic alterations to the face that result in a change in facial look include eye lifts, nose contouring, and jaw enlargement [17]. Face recognition algorithms have been built to withstand the impacts of cosmetic surgery.

### 2.5 Ageing

Ageing is regarded a type of within-class appearance variation in human faces when there is a large temporal gap between the targeted face image of the same individual and the target face image in a face recognition system [44]. As illustrated in Figure 6, age has a significant impact on one's overall facial structure. As people get older, their facial features may change [80].



**Figure 6: - Face features during ageing process**

### 2.6 Occlusion

Occlusion is the obstruction or blockage of a specific area of a picture or entity. As a result, occlusion of the facial image happens when a portion of the face is obscured or occluded, decreasing the output of the face recognition system, whether intentionally or inadvertently. [66, 100]. Terrorist attacks, ATM robberies, and burglaries are all examples of criminal conduct. These activities are usually carried out by personnel whose faces are so covered that even attached cameras can't recognise them [45,46,47]. Because considerable information from the face image is lost when scarves, sunglasses, or hats hide the face image, as shown in Fig. 7, the facial recognition system's output will be impaired [50]. Occlusion frequently results in a colour change in the image of the face [25]. As a result, face recognition systems must be built to survive occlusion.



**Figure 7: - Occlusion images**

### 3. FACE RECOGNITION TECHNIQUES

Face identification is a rapidly increasing and difficult study area in image processing and computer vision, hence numerous algorithms have been developed [15]. These strategies have shown satisfactory results, particularly in well-controlled situations, but performance in real-world scenarios suffers [51]. In this section, we'll go through the various tactics used in the stages of Face Recognition System (as shown in Fig. 1), as well as their advantages and drawbacks [80].

#### 3.1 Extracting Features Techniques

The FRS's feature extraction stage involves reducing the number of resources needed to represent a significant amount of data [53]. Feature extraction is a method of shrinking an original face dataset by removing properties that could be utilised to recognise and extract patterns from input facial images [52]. The sub-sections below detail the various approaches for extracting characteristics from facial photographs.

#### 3.2 Principal Component Analysis

The Eigenface or Karhunen-Loeve expansion, commonly known as Principal Component Analysis (PCA), is a well-known face identification technique [71]. Sirovich and Kirby were the first to use PCA to describe photos of the human face in 1987, after reporting that face images can be changed by a minimal aggregation of weights for each face and a standard face image [54,55]. Turk and Pentland proposed the Eigenfaces face recognition system [88] in 1991. Standard features are taken from the face picture after removing the average face vector from the face vector, and unique features are left after subtracting the average face vector from the face vector. The eigenvectors are then calculated using a reduced dimensionality covariance structure that corresponds to the Eigenvalues, i.e., a larger eigenvector receiving greater data variance equates to a larger eigenvalue [57].

#### 3.4 Dynamic Link Architecture

The dynamic connection architecture (DLA) is a neural information processing method that was first proposed in 1981 to solve problems with artificial neural networks (ANNs), such as syntactical relationship expression [70]. The DLA's central concept is to employ synaptic plasticity to organise groups of neurons into higher symbolic units, which is already possible on the time scale of information processing rather than simply for memory acquisition. The DLA's abilities truly shine when it comes to face recognition tasks like facial expression and invariant object recognition [72,73]. For FR, a DLA based on multiscale morphological dilation-erosion was created, resulting in a feature vector that could be used to validate people's faces in a test collection. The recommended method outperformed Gabor wavelet-based dynamic relation matching in their tests.

#### 3.9 Feature Classification Techniques

The stage of feature classification involves categorising the obtained facial feature data into one of various classes based on the task at hand. The following sections go through the different types of feature classification techniques.

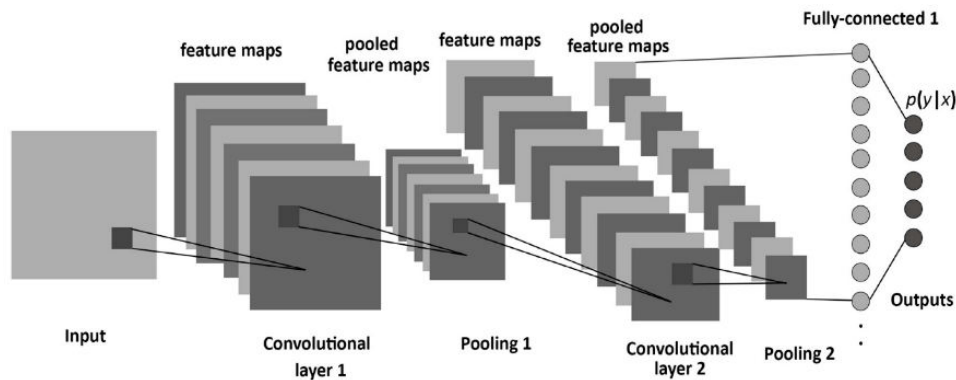
#### 3.10 Artificial Neural Network

An Artificial Neural Network is a system of interconnected artificial neurons that can exchange signals and learn from experience (ANN). They are based on the biological neural system, which functions as the brain's processing unit and consists of a network of interconnected neurons linked by synapses [77]. An artificial neural network (ANN) is a type of classification system that can predict both known and unknown data. During the training process, the numeric weights of the interconnected neurons are modified such that a well-trained network reacts quickly when faced with a recognition challenge. There are also multiple layers of feature-detecting neurons, each with its own set of neurons that respond to the previous layer's inputs. The initial layer recognises a set of inputs, with successive levels recognising "patterns of patterns" found by previous layers.

#### 3.11 (CNN) Convolutional Neural Network

Biological data contained in the visual brain of mammals is thought to have inspired the Convolutional Neural Network. Certain parts of the visual field are responsive to small clusters of cells in the visual cortex. Certain brain neuronal cells only fire when they detect the borders of a specific orientation, according to Hubel and Wiesel. However, it has lately been revitalised, and it now outperforms most computer vision systems while continuing to improve at a rapid rate [32]. Convolutional layers, pooling layers, nonlinear layers, and completely linked layers are all part of the CNN architecture. The impact of each layer on the CNN network's efficiency for various recognition tasks determines its efficiency. The entirely linked layers process visual information and offer an output, while the convolution and pooling layers serve as a feature extraction neural network [14]. Figure 12 shows a standardised design for the CNN approach for object recognition.





**Figure 12:** - CNN standard architecture

The CNN is a replacement for the NN that attempts to address the NN's flaws. The number of free parameters grows when the input dimension is big in terms of the number of connections and images, because each hidden unit has a link to the input layer. As a result, in comparison to the pattern dimension, the number of training samples may be insufficient, indicating that the NN is sophisticated and data overfitting may occur. As a result, unlike NN designs, the CNN trains local feature extractors and applies the weight sharing principle automatically, reducing the number of free parameters and therefore increasing performance potential [18]. The CNN is a feed-forward artificial neural network that has had a lot of success in the field of image recognition.

## 5. FUTURE RESEARCH DIRECTIONS

The present state of facial recognition device research was described in the preceding sections. The face recognition system, also known as face recognition in the wild, has had its lighting, cosmetic surgery, voice, occlusion, ageing, posture and low-resolution concerns addressed [20]. The topic of stance and emotion has gotten the most attention in the literature, whereas others like occlusion, lighting, and low resolution have gotten less. As a result, researchers should produce facial datasets that address these challenges so that they can develop algorithms that are resistant to these limits. As a result, researchers should produce facial datasets that address these challenges so that they can develop algorithms that can withstand these limits. The following study directions can be considered as a result of this article's critical analysis: Because most face recognition algorithms focus on the feature extraction and classification stages, simple pre-processing procedures that can improve face recognition systems are often disregarded [21]. Face alignment, for example, has recently gained popularity due to its broad use in automated face analysis. However, in unconstrained situations, it has proven to be rather tough. Face picture enhancement is another pre-processing stage that can help increase the effectiveness of face recognition systems [68]. The method's inability to remove relevant components from improved face pictures that could be used for classification is one of its major shortcomings [67]. As a result, one feature of the CNN architecture can be leveraged to address some of the most common challenges with face recognition in order to achieve the best results. The CNN's output is heavily reliant on the pooling method utilised, which is also a characteristic of the input picture [86], because the pooling layer comprises both maximum and average pooling. Although both the max and average pooling strategies outperform each other on specific datasets, it is unknown if one will outperform the other on different face recognition challenges. Other strategies for determining which features will perform well in the pooling layer are also available [24].

## 6. CONCLUSION

We looked at scholarly literature on facial recognition strategies that have evolved over time for this study. After that, recent academic literature from 2015 to the present was evaluated to ascertain the amount of work done in the field of facial recognition systems and to present a state-of-the-art score. Face recognition in the wild and face recognition under unconstrained situations are two features of the face recognition scheme that have been discussed. These issues were identified, along with the reasons why they should be investigated on a regular basis. The many methods addressed in the literature are also presented. We also summarised the many strategies utilised to develop a strong facial recognition system that can solve a number of real-world problems. The best output of the various algorithms on the various facial recognition limitations, on the other hand, is still under development. Face datasets with considerable face recognition system restrictions are examined, and state-of-the-art findings are shown for each dataset. We stress the importance of having simple access to face recognition datasets while also noting that a face dataset may be constructed to incorporate most of the important restrictions. This study also offers essential research subjects for the future, and it is written in a way that will be useful to both novice and experienced researchers in this field.

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**A REVIEW ON E-LEARNING BASED ON CLOUD COMPUTING**

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**ABSTRACT**

*Cloud technology and e-learning are getting more and more popular, and they now play a significant and strong role in the field of education and learning. In the educational area, cloud computing becomes a necessary service that goes beyond the classroom. E-learning and cloud computing are expanding quickly, and they are both highly important to the subject of education and learning. Because of this, users of smartphones may do their tasks quickly and effectively while spending less money if they utilise the cloud-based applications provided by cloud service providers. One of the most significant problems that has hampered the expansion of cloud computing is security. In light of their standard design and particular security needs, this paper reveals the use of cloud computing services in e-Learning systems. Due to technology advancements in support of e-learning and the growing number of heterogeneous devices connected to such systems, e-learning systems have gained in popularity in recent years. Cloud computing has immense promise, and it has attracted the educational industry as a means of delivering instructional information in a cost-effective, secure, and dependable manner. Today's cloud architecture combines distributed computing, grid computing, and virtualization technologies to provide flexible execution environments in which various resources may be coupled to application and platform components. Beyond the classroom, cloud computing is becoming a crucial service in the educational sector. Higher education, distant learning, online learning, etc. leverage cloud computing technologies to provide students more freedom. The capacity of architecture to change while maintaining the strength of objectives is known as continuity, and this attribute of a cloud system has an influence on its economic viability. The current paper examines the current state of cloud-based e-learning systems and compares the available cloud-based e-learning architecture with the goal of improving the architecture's ability in light of current technologies such as the Internet of Things (IoT), Fog Computing (FC), and Big Data Streams.*

*Keywords: Cloud Computing, E-learning, Cloud Based e- learning, E-learning portal.*

**I. INTRODUCTION**

E-learning is a type of learning that is based on formalised instruction but uses electronic resources. Infrastructure is one of the most significant components of an E-learning system, and it has a direct influence on the system's success and stability. The use of the World Wide Web for communication (between clients and servers) in e-learning (both traditional and cloud-based) and virtual distance learning (virtual) is an essential teaching-learning resource. These online courses rely on cloud platform architecture to process, store, and deliver learning objects and material. Cloud computing, as a new sort of advanced software, has boosted computer industry innovation in recent years. Cloud computing is a computer architecture built on networks, particularly the Internet, whose goal is to allow users to use computing resources on demand and pay for them using a metering system similar to that used for water and electricity. In order to provide improved security and high performance in the cloud computing environment for online education, work has been carried. Data transfer is done on a regular basis with cloud computing technologies. As a result, protection must be considered in the backdrop of cloud services. The research enhance the effectiveness and security of cloud-based distant education systems, due to higher services. Cloud computing utilises computer networks to give universal, appropriate, and on-demand access to all of a cloud system's hardware/software computing resources. Users of cloud e- learning get services on a "pay-as-you-go" basis, and the dynamic cloud implementation settings provided by cloud platforms provide such systems more flexibility. Cloud services, such as cloud servers, networks, and apps, are shared by e-learning cloud systems. Cloud computing employs a service-oriented design that provides "resources (hardware/software) as a service." The IaaS model provides basic computing resources to cloud users for executing the needed operating system and apps. Software developers may use PaaS to deploy their apps on the cloud. Users of SaaS programmes do not have to worry about cloud infrastructure.

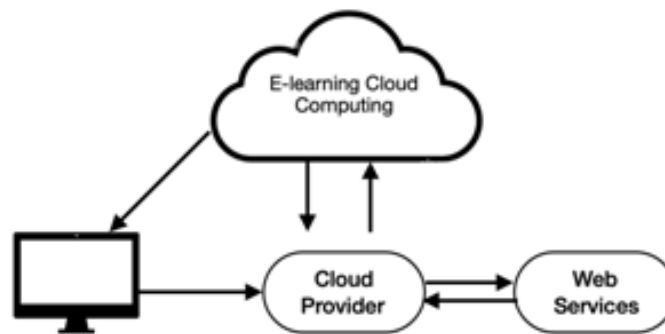


Fig.1 : E-learning Cloud Computing

## II. What is E - Learning

E-Learning is a strategy for accessing educational content outside of a traditional classroom by employing electronic technology. E-learning, also known as online learning or electronic learning, is the process of acquiring information via the use of electronic media and technology. Most conventional education formats are no longer fit for social advancement and educational development, and they are unable to keep up with changes in learning demand in a timely manner, therefore computer networks have provided chances. As a result, an E-learning system based on Cloud computing infrastructure is viable, and it may significantly enhance investment efficiency and management power, turning E-learning system development into a virtuous loop that benefits both suppliers and consumers. As the use of cloud computing architecture grows, more sectors are shifting their attention away from investing in processing power and toward renting processing power from a specialised vendor. Many educational institutions are unable to make such expenditures, and cloud computing is the most cost-effective answer for them. Many programmes, including word processing, spreadsheets, presentations, databases, and more, may be accessed through a web browser, with the software and files stored on the cloud.

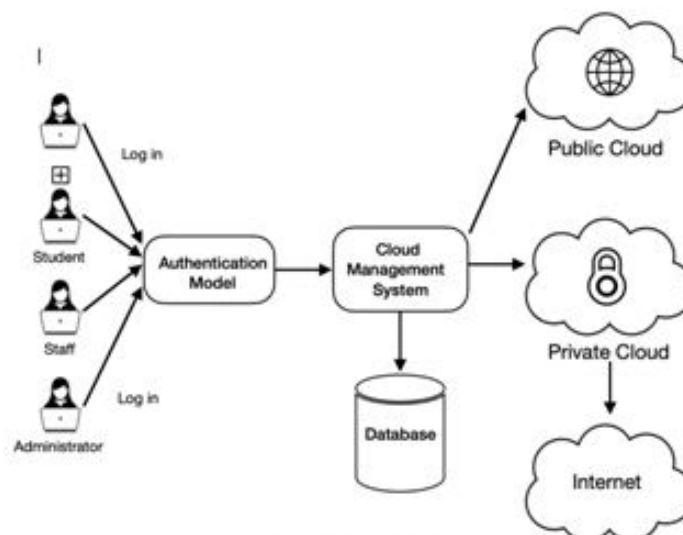


Fig.2 : E-Learning Portal

## III. What is Cloud Computing

Cloud computing involves the utilization of different services through the Internet. Data storage, servers, databases, networking, and software just are a few of tools and applications available. Cloud-based storage allows users to store files to a web database rather than keeping them on a proprietary hard drive or local storage device. As long as if an electronic device has internet access, it has access to data and the software applications needed to execute it. For a variety of reasons, including cost savings, greater productivity, speed and efficiency, performance, and security, cloud computing is a popular alternative for people and businesses. Cloud computing delivers services across a public or private network. At a remote place, cloud is available. It may be used in both a broad and a local network. Cloud computing might be used for virtual private networks as well. Many applications, such as e-mail and web-based conferencing, are made possible by cloud-based technologies. Platform independence is now possible thanks to cloud computing. It is made possible by the fact that no client system has to be configured.

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**IV. LITERATURE REVIEW**

Ghazal Riahi et.al : This paper describe cloud computing into an E-learning system as its infrastructure to build a sustainable and flourishing E learning. This provides for some important and entertaining features: I monitoring the status of resource configuration and consumption in real time, allocating resources on demand, and making full use of resources ii) enabling workloads to recover from inevitable hardware/software failures iii) to encourage the evolution or extinction of learning species, such as learning contents, services, and applications He then describes traditional E-learning before providing a foundation for E-learning cloud. Most conventional education formats are no longer suited for the requirements of social growth and educational development, and they are unable to keep up with changes in learning demand in real time, thus computer networks have provided chances for it. Allow vendors to build an E-learning system and give a new method of E-learning. System construction and maintenance are placed in the interior of educational institutions or businesses, which creates a number of issues, such as a large amount of investment required but no capital gains to return, as well as a lack of development potential and staying power. It may substantially increase investment efficiency and management power, turning E-learning system growth into a virtuous loop and achieving a win-win scenario for suppliers and customers. Browser-based apps work with a wide range of computer and mobile operating systems. They are designed to execute programmes as services via the Internet using scalable infrastructure. Despite the fact that Cloud computing is a fantastic potential for the information technology business, we have developed a Cloud computing technology that has substantial benefits, such as lower computational costs and software. It is possible to observe the efficiency produced by rapid and permanent updating software capacity store infinite, more reliable data, worldwide access to documents, and simpler cooperation. Computing in the cloud The capacity to dynamically assign compute and storage resources necessary for E-learning is not completely supported by traditional. This indicates that in future work, we will present a way for improving the efficiency of E-learning using cloud computing infrastructure.

Dr.Ajay Rana et.al: This paper will elaborate about the e learning techniques will be use in cloud computing for distance education and also gives the architecture for e learning portal in cloud with their different cloud services.The promise of utility computing has now come true thanks to cloud computing, which has been assisting the IT industry's entry into the field of education in general and e-learning in particular. With current improvements in computing trends such as fog computing, big data, and big data streams, the full knowledge domain is exposed to the teaching-learning community. On a vast array of diverse gadgets connected to the internet, there is access to knowledge materials. An effective, elastic, and reliable architecture is the ultimate goal of research into cloud-based e-learning. The degree of flexibility in the architecture's change management determines the long-tem viability and continuation of the cloud architecture. Applications are software systems delivered through services, and the cloud offers a layered distributed architecture. The flexibility and capability of real-time processing have further been added to the current e-learning clouds by fog computing and huge data streams generated by the Internet of Things (IoT), making them increasingly suited for educational institutions. The adoption of cloud-based e-learning systems still faces several challenges in spite of all the efforts listed above. The biggest difficulty is lowering the cost of online education for the student population. Change management is unclear and difficult due to the cloud's dispersed and diverse nature. Thus sets constraints and mandates that cloud architecture management be enhanced in each subsequent iteration, including the modules, and this creates internal constraints part of cloud. The differences between the services and the management of services should be made explicit.

Shefali Arora, Dr. Naveen Nandal et.al: This paper disclose the Internal cyber-attacks is a lack of effective IT rules and processes in e-Learning systems, in light of their standard architecture and their specific security requirements. In order to guarantee that interested and authorised actors only have access to the proper information at the proper time, security becomes a significant problem. One of the main difficulties that has been hindering the development of cloud computing is security. Users must be aware of the possibility of data breaches in a cloud environment. Here, the author explains how to establish security in a cloud environment using the RSA Algorithm and how data may be secured by doing so. In order to improve security while maintaining high performance for cloud computing environments for remote learning, research has been done. By implementing a content substitution technique that substitutes short words for large words, performance has been improved. Data transfer happens often. The Internet is used to send this data. Many applications, like email and web-based conferences, are executed with the use of cloud-based technologies. Because no client system needs to be configured, platform independence is made feasible. Everyone is aware that offices regularly employ mobile applications. These programs are used in conjunction with cloud computing. Studies already conducted have examined the difficulties in integrating cloud infrastructure for academics, staff, and students in the educational setting. Security monitoring is a major problem for the education sector in industrialized

nations. A few studies looked into the difficulty of lowering the cost of distant education. The expansion of the educational system via the cloud requires additional focus. Data transfer occurs often in cloud computing. The Internet is used to send this data. fix problems with the cloud-based online education system since security-related problems are rising as this technology develops. Furthermore, research that is suffering from poor performance has paved the way for the creation of new technologies with improved performance.

Kanishk Peryala et.al: This paper is discuss about the Learning application based on cloud computing with the use of amazon web services. The paper will more discuss about the learning application from to the login page to the learning material discuss in the application. Since the current pandemic, there has been a dramatic increase in the usage of e-learning applications, making it the newest reformer in the education industry. Everyone, including both students and working adults, has access to e-learning applications. The majority of e-learning systems are affordable or free, simple to use, and devoid of any obvious problems for consumers. Many businesses, institutions, and universities have expressed interest in using e-learning apps for their training sessions or to encourage their students to enrol in the platform's many courses. The key to creating a good e-learning application is creating information that is simple to grasp and including extra resources in the application. For their employees or students to have a smart manner of learning digitally, universities or corporations can apply this Project E-learning application's real-time approach. All of the elements that go into producing a quality e-learning environment are collectively referred to as the "e-learning ecosystem." The three types of these aspects are content suppliers, consultants, and infrastructure. To create, host, manage, and govern e-learning, a system, service, or tool is referred to as infrastructure. Building an e-learning environment requires an infrastructure that can meet the needs for storage and computing. This model is a self-improving, self-regulating, reliable, dynamic, scalable, collaborative, cost-effective, and quality-of-service guaranteed e-learning system. This work may be effectively used as a global e-learning solution by universities, corporations, and communities. Cloud computing, a novel technology, could be advantageous for e-learning.

Pavankumar Naik et.al : This Paper discusses the sequential completion of each process. Admin and user logins are defined correctly. How to build a website and how the cloud functions work. Implementation is concerned with the methods used for back end connectivity and the front end design tools. The web application was created using Eclipse as the tool. Mysql and JDK are the other tools used. Java and HTML are the programming languages we are using. Angular JS and Bootstrap are the programming languages used. AngularJS, also known as "Angular.js" or "AngularJS 1.X," is an open-source front-end web application framework based on JavaScript that is primarily maintained by Google and by a community of people and businesses to address many of the difficulties associated with creating single-page applications. The HTML page, which contains additional embedded custom tag attributes, is initially read by the AngularJS framework to begin working. A front-end web framework for creating websites and web apps, Bootstrap is open-source and free. It includes optional JavaScript extensions along with HTML and CSS-based design templates for navigation, buttons, forms, buttons, and other interface elements. It only focuses on front-end development, unlike many other web frameworks. In the MySQL command prompt, the tables are only created once. Hybrnet handles the connection between the front ends and the backend. Java Framework called Hybrnet is open source. The mapping of Java classes to database tables is its key feature. We developed a web application employing the aforementioned concepts in three steps: Step 1: Development of Web Application using html, css and Java. Step 2: Creating tables in Mysql command line prompt. Step3: Hosting the Application in cloud and Running in browser.

Alameen Abdalrahman et.al : This paper looks at how e-learning systems often need a lot of hardware and software resources, and how cloud computing provides all the features that e-learning systems require, making it the perfect technology for educational purposes. Cloud computing is a great choice for e-learning since it offers the services and facilities needed for learning. A novel paradigm known as "cloud computing" enables quick network access to a suitable pool of computer resources that may be offered and released with just minimal effort and service provider reciprocity. The learning provider has less visibility into how the student is engaged with the educational environment in an E-learning scenario because they are separated from each other by cyberspace. According to the National Institute of Standards and Technology, cloud computing is "a model for enabling ubiquitous, accessible, on-demand network access to a shared pool of configurable computing resources" (e.g., networks, servers, storage, applications, and services) that may be quickly provided and released with no administrative effort or service provider contact (NIST).. As a result, a wide range of end users can access the programmes and data that the cloud offers. Service accessibility, pay as you go pricing, and scalability are the three core tenets of cloud computing. During the first Gulf War, Iraqi troops were in Kuwait. Accessibility 3.2.3 This assists in making data and services accessible to the general public without exposing sensitive information to risk. The client will take advantage of all of the hardware parts, software, and other



cloud computing-related developments. Nothing is going to be achievable without the client. The client could take one of two forms: a piece of hardware or a cloud computing platform that runs on a service-driven business model. Platform-as-a With a focus on the market, service solutions offer environments and application development platforms for integrating cloud computing into current applications, services, and infrastructure. Today, e-learning is frequently used at all levels of education, including continuing education, corporate training, academic courses, etc. There are many different e-learning options, both free and paid. Virtualization allows for the quick replacement of a compromised cloud server without incurring significant expenditures or damages[9]. Because it is so simple to make a copy of a virtual computer, it is anticipated that cloud downtime will be significantly decreased.

Navish Samyan et.al : Our literature review in these paper are Countries rely heavily on the advancement of technology as well as people's ability to learn new skills and knowledge through education. The globe is currently observing how schools, universities, professors, and students access education online as a result of the COVID-19 pandemic. After many years, traditional teaching and learning acknowledge change. Online apps and cloud-based technologies are used to provide lessons, allow students to submit assignments and projects, and to continuously monitor their progress. No one could have predicted that technology would one day become a potent tool for facilitating teaching and learning, particularly during a pandemic, according to Christensen (1997). This study demonstrates how using cloud computing in online education enables users to access, store, and retrieve data using a cloud system from any location at any time during the COVID-19 pandemic. Teachers can increase the quality and effectiveness of their instruction by using cloud computing. E-learning that is collaborative inspires students. The use of cloud computing in e-learning has various benefits, including lower costs, more storage capacity, and data security. Students, instructors, and academics must be given the opportunity to develop their digital literacy and skills. The study also sheds light on the problem of a shoddy cloud infrastructure, a lack of technological resources, and a slow internet connection. The unwillingness of new users who are not digital natives to accept, use, and interact with cloud-based technologies in e-Learning is demonstrated in this article. As Chen et al. emphasise, improving user experience is a crucial issue to take into account (2020). The adoption of a suitable cloud-based education model and the encouragement of students and educators to use cloud technologies in e-Learning are therefore crucial for schools and universities. IaaS, SaaS, and PaaS service models should receive more attention, as well as deployment models. This study concludes by recommending the use of cloud-based technology in educational institutions and the enhancement of e-learning skills among teachers and students through the use of cloud-based apps.

## **V. Types of Cloud Computing**

Cloud computing, unlike a microprocessor or a telephone, is not a single piece of technology. Rather, it's a system made up of three services: software-as-a-service (SaaS), infrastructure-as-a- service (IaaS), and platform-as-a-service (Platform-as-a-Service) (PaaS).

### **Software-as-a-service (SaaS)**

The licencing of a software programme to consumers is described as software-as-a-service (SaaS). Pay-as-you-go or on-demand licencing is the most common method of providing licences. This kind of solution is accessible Office 365.

### **Infrastructure-as-A-Service (IaaS)**

Infrastructure-as-a-service (IaaS) is a delivery technique that uses IP-based interconnection to supply something from operating systems to servers and storage as part of an on-demand service. Instead of purchasing software or servers, clients can use an outsourced, on-demand service to obtain these resources. IBM Cloud and Microsoft Azure are two popular IaaS systems.

### **Platform-as-a-service (PaaS)**

The most difficult of the three levels of cloud computing is platform-as-a-service (PaaS). PaaS is similar to SaaS in that it is a platform for generating software that is supplied over the Internet rather than providing applications online. Platforms like as Salesforce.com and Heroku fit within this approach.

## **VI. Cloud based E learning**

Most educational institutions are unable to implement e-learning on a broad scale due to an increase in the number of students and the mass expansion of instructional content. Traditional e- learning systems' ever-increasing hardware and software costs have prompted academics to look for alternatives, with cloud-based e-learning solutions emerging as the most promising. With its service-oriented design, cloud-based e-learning comes to the rescue. The architecture of an e- learning cloud ensures its technological durability in the face of

changing environmental conditions. The following are the key distinctions between traditional e-learning architecture and cloud-based architecture.

Sr.No.	Traditional approach to e- learning	Cloud approach to e- learning
1	* Get own hardware and software * Experts needed to run and maintain the technical architecture	* Get service from the cloud provider on “as- you-go” basis * No technical experts required
2	* Pay for the hardware and software * Extra expenditure for administration	*Pay for using the cloud services *Less administrative overheads
3	* Networks with in institution *Institutions access device	* Via internet *Any computer connected to internet
4	* Huge investment and expensive *Time consuming	*Cheaper *Less time consuming

### Pros and Cons of E – Learning -

Remote access to your period stipulated is one of the greatest benefits of online education. Studying online has a number of advantages, such access to a large number of teaching resources. In this, you may rewind the video and audio materials as many times as you need to grasp the topic. Because you are not reliant on anyone, this way of learning promotes positive and autonomous learning. You can train whenever you choose, and you'll always be able to seek help from your teachers and peers via online discussion boards and chats. If you value face-to-face learning, however, e-learning may not be suitable.

### Advantages of E-Learning Are -

It promotes active and independent learning. Efficient manner of delivering courses since materials are available from anywhere and at any time. Students may communicate with peers from all over the world through group discussions and private chats. Studying material can be accessed an infinite number of times.

### Disadvantages of E-Learning Are -

- The security of online learning is sometimes questioned
- The validity of a particular student's work cannot be confirmed.
- Self-training is not for everyone.

### VII.FUTURE SCOPE

Further research is expected to result in a safe and high-performance online e-learning system. Such study is intended to address challenges that have arisen in the online education cloud system as a result of the rising growth of this technology, which has resulted in an increase in security concerns. Furthermore, research that has been hampered by a lack of performance has set the groundwork for the creation of new technologies with improved performance.

### VIII.CONCLUSION

Cloud-based E-learning, according to experts, is a new generation of traditional E-learning. Cloud computing, however, and e-learning cloud infrastructure. According to the overview provided in the analysis, using cloud services for e-learning is a good alternative because it enables teachers to take advantage of the adaptability, flexibility, and security of the cloud to represent the main framework of e-learning instruction that is accessible from any location, at any time, and using any device. We can fully take advantage of the benefits it offers when an effective learning environment with specialised material is simple to adapt to the educational paradigm used today. A few benefits of putting an e-learning system into the cloud include increased storage, processing power, and network access. Prioritizing software and hardware reductions is necessary. In comparison, it offers a wider array of fantastic educational options for a lower licence fee. The extended machine life does, however, result in a lower replacement rate for student PCs.

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## ROLE AND APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN PHARMACY

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## ABSTRACT

1. AI aims to create intelligent modelling that helps in knowledge generation, problem solving, and decision making. Artificial intelligence (AI) application has recently increased in many sections of society, with industry of medications being a main focus.
2. AI today plays a key role in many areas of pharmacy like, hospital pharmacy, drug discovery, drug delivery formulation development, polypharmacology, or so on.
3. Deep Neural Networks (DNNs), Recurrent Neural Networks (RNNs) or Artificial Neural Networks (ANNs) or are used in drug delivery formulation development or drug discovery.
4. Several drug discovery implementations are currently being studied or supported the technology's control within quantitative structure-activity relationship (QSAR) or quantitative structure-property relationship (QSPR).
5. Furthermore, de novo design favour's the creation of newer explored drug particles with ideal qualities/desired properties.
6. Currently, artificial intelligence is used in almost every industry.
7. A healthcare or pharmaceutical industries are recently embracing AI for a diverse range of reasons applications, with drug design or drug discovery, product development, manufacturing process improvement, drug adherence and drug repurposing,
8. Predictive biomarkers, predicting treatment results, identifying clinical trial candidates, rare diseases, and personalized medicine, processing biomedical and clinical data, medical imaging, analysing gene expression pattern, and detecting rare diseases.
9. The crucial principle of information science, a better statement for AI might be "augmented intelligence," or combining the strengths of computers and clinicians to improve patient outcomes.
10. Implementation technique could save time and costs even while enabling a better understanding of process and formulation parameters.
11. Understanding the terminology and methods used in artificial intelligence will enable clinicians to productively communicate with data scientists in order to collaborate on developing models that augment patient care.
12. This primer discusses approaches to identifying practice problems that could benefit from AI application and those that would not, as well as methods for training, validating, implementing, evaluating, and maintaining AI models. Some of the key limitations of AI in the medication-use process are also discussed.

**Keywords:** ANI: Artificial narrow intelligence; ANN: Artificial neural network; AGI: Artificial general intelligence; QSPR: Quantitative structure-property relationship; QSAR: Quantitative structure-activity relationship.

## 1. INTRODUCTION

Artificial intelligence is the process of simulating human intelligence in computers so that they can think and act like people. These characteristics of AI give it a unique capacity to analyse and choose actions that stand the best possibility of reaching a given objective. Machines capable of logic, reasoning, planning, learning, and perception are included in the science of "With the use of many algorithms, it aims employing computer-like technologies to replicate even the most fundamental human intellectual abilities. AI can be a useful tool for a variety of tasks, including pattern recognition, problem solving, and even data classification. Machine learning is a concept that AI can use to analyse situations by mimic the human mind in terms of learning and analysis and assisting with problem-solving (ML). Conceptual frameworks called artificial neural networks (ANN) are specifically created to implement AI algorithms. As an interconnected network of neurons created by weighted communication channels between neurons, they fully mirror the human brain. These are made up of a number of connected nodes that communicate with one another to effectively perform the necessary function (1).

The pharmaceutical industry has greatly expanded its data digitization during the last few years. The difficulty of collecting, examining, and utilizing that knowledge to resolve challenging healthcare problems comes with this digitalization, too. Because AI can handle massive amounts of data with improved automation, this encourages its use. A technology-based system called artificial intelligence (AI) can imitate human intelligence by using a variety of cutting-edge tools and networks. It does not, however, pose a danger to totally displace human physical presence. AI makes use of hardware and software that can analyse and learn from entered details to make independent judgments for achieving predetermined goals.

## 2. AI CATEGORIES

AI can be divided into two categories based on their presence and calibre.

The following categories of AI exist based on their capabilities:

- i) **Weak AI or Artificial Narrow Intelligence (ANI):** It is capable of performing a limited set of tasks, such as facial recognition, car steering, chess practice, etc.
- ii) **Artificial General Intelligence (AGI),** also known as **Strong AI**, is an artificial intelligence that can do all tasks at a human level. That can clarify human intelligence and enable completion of challenging tasks.
- iii) **Artificial Super Intelligence (ASI):** It is more intelligent than people and is much busier than people in terms of sketching, math, space, etc.

Based on its absence or presence, AI can be category as follows.:

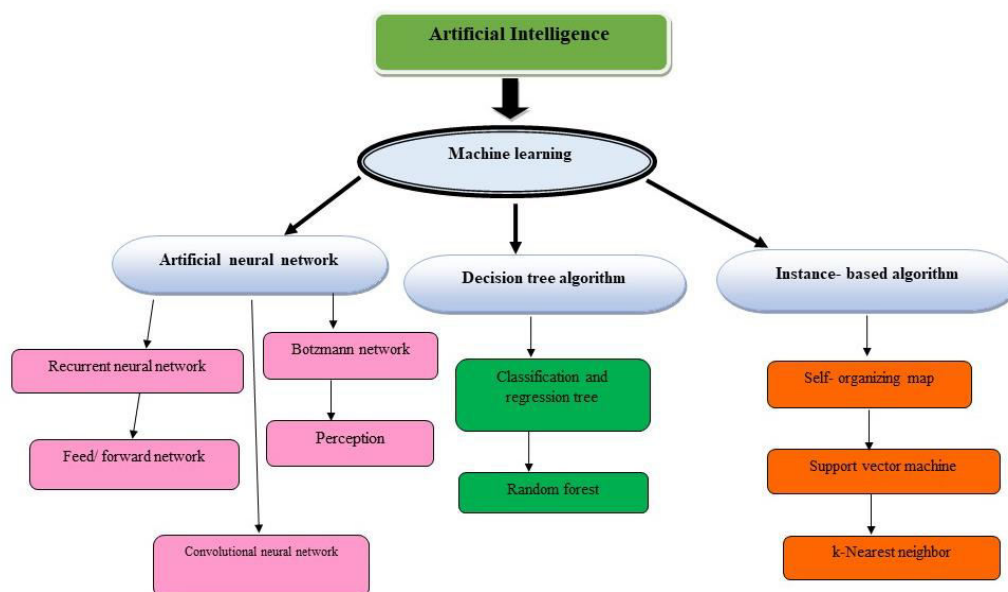
- i) **Type 1:** It is put in use for narrow-purpose applications that is incapable of using experiences due to the absence of a storage system. It is referred to as a reactive machine. Some examples of such memory are an IBM chess program that can identify checkers and make predictions on a chess board.
- ii) **Type 2:** It contains a certain small memory system that can solve various problems using stored experiences. This system can make decisions in automated vehicles. Some observations are recorded that are used for further actions, but these observations are not permanently stored.
- iii) **Type 3:** It is based on "Theory of Mind." Which is that human decisions are influenced by their individual thoughts, intentions, and aspirations. It is a non-existent AI system.
- iv) **Type 4:** It possesses a sense, consciousness or self-awareness, which is also a non-existent AI system(2).

## 3. PHARMACEUTICAL RELEVANCE OF AI

- a) The utilization of AI models also allows for the prediction of in vivo responses, pharmacokinetic parameters of therapeutics, appropriate dosing, and so on.
- b) Given the importance of drug pharmacokinetic prediction, the utilisation of in silico models facilitates their effectiveness and low cost in drug research.
- c) balance stringency with the need for rapid innovation, and
- d) Include definitions and interpretability requirements for any model used in the medication administration process.

## 4. AI: TOOLS AND NETWORKS

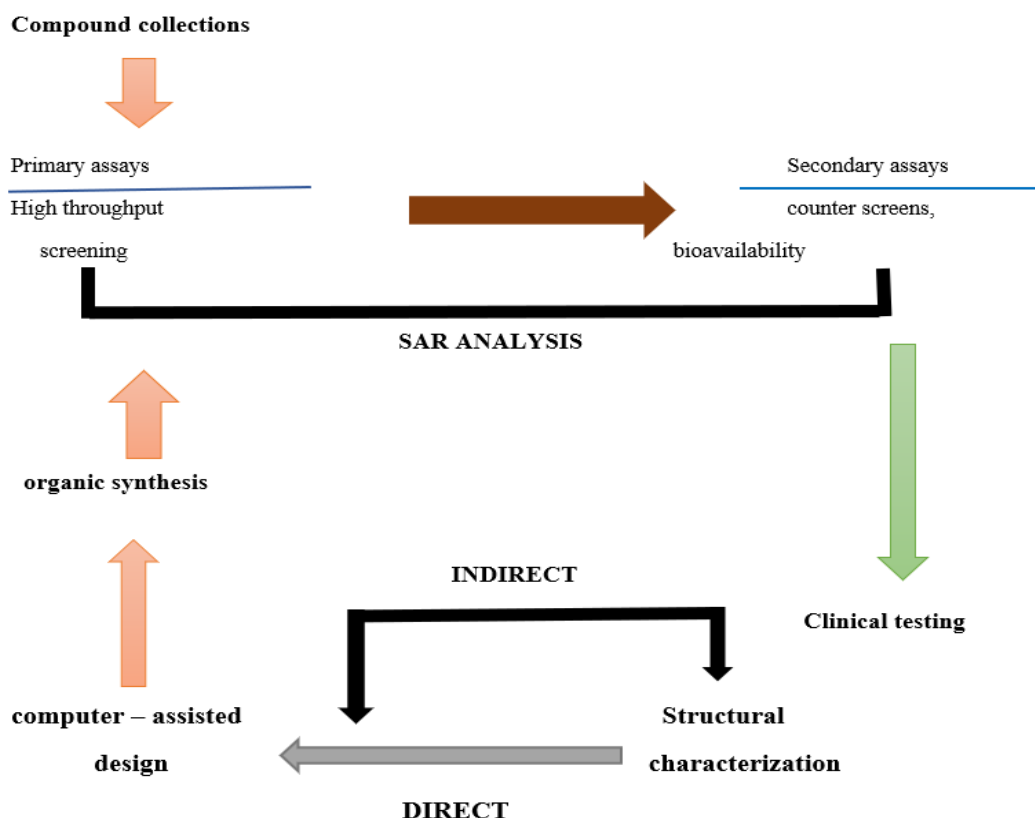
AI contains many method domains, including knowledge representation, reasoning, search for solution, and a fundamental machine learning model (ML). ML uses recognitive pattern algorithms in a previously classified set of data. Deep learning (DL) a subfield of machine learning that uses artificial neural networks (ANNs). These are a collection of sophisticated computing elements interconnected that include 'perceptons,' which are similar to human neurons and imitate the transmission of electrical impulses in the human brain. ANNs are a collection of nodes that receive separate inputs before changing them to output, either singly or multilinked, using algorithms to solve problems. ANNs are classified into three types: multilayer perceptron (MLP) networks, recurrent neural networks (RNNs), and convolutional neural networks (CNNs) that make use of either supervised or unsupervised learning procedures for training(3). Figure 1 illustrate AI Applications in drug discovery and development



**Figure 1:** AI Applications in drug discovery and development

### 5. AI Use for Drug Discovery and Their Applications

The drug discovery process begins with the results obtained from various resources such as high throughput screening modelling, fragment screening modelling, computational modelling, and previously reported data. Figure 3 illustrates a simplified outline of the drug discovery procedure. The structural properties of drug molecules can be examined directly or indirectly by computer-assisted approaches during the drug discovery procedure, and then organic production of drug molecules is performed. The produced drug molecules or collected drug compounds are highly screened in primary assays, followed by counter screening and evaluation for availability in secondary assays, as well as successful structure activity relationship (SAR) analysis. The drug discovery process undergoes induction and deduction processes. Figure 2 illustrated Drug discovery procedure in schematic outline(4).



**Figure 2:** Drug discovery procedure in schematic outline

### A. AI In Screening of Drugs

The process of discovering and developing a drug can take years and cost an average of \$2.8 billion. Even so, 90% therapeutic molecules fail Phase II clinical trials and are not approved by regulators. Algorithms such as Nearest-Neighbour classifiers, RF, extreme learning machines, SVMs, and deep neural networks (DNNs) are used for VS and can predict in vivo activity and toxicity. Several biopharmaceutical companies, including Bayer, Roche, and Pfizer, have collaborated with IT firms to create a platform for the discovery of therapies for immuno-oncology and cardiovascular disease. The following sections discuss the aspects of VS to which AI has been applied(5).

### B. Prediction of Bioactivity

The affinity of drug molecules for the target protein or receptor determines their efficacy. Drug molecules that do not interact with the targeted protein will not be able to provide the therapeutic response. In some cases, developed drug molecules may also interact with unintended receptors, resulting in toxicity. As a result, drug target binding affinity (DTBA) is critical for predicting drug-target interactions. AI-based methods can calculate a drug's binding affinity by taking into account the features or similarities between the drug and its target. To determine the feature vectors, feature-based interactions certify the chemical moieties of the drug and the target(6).

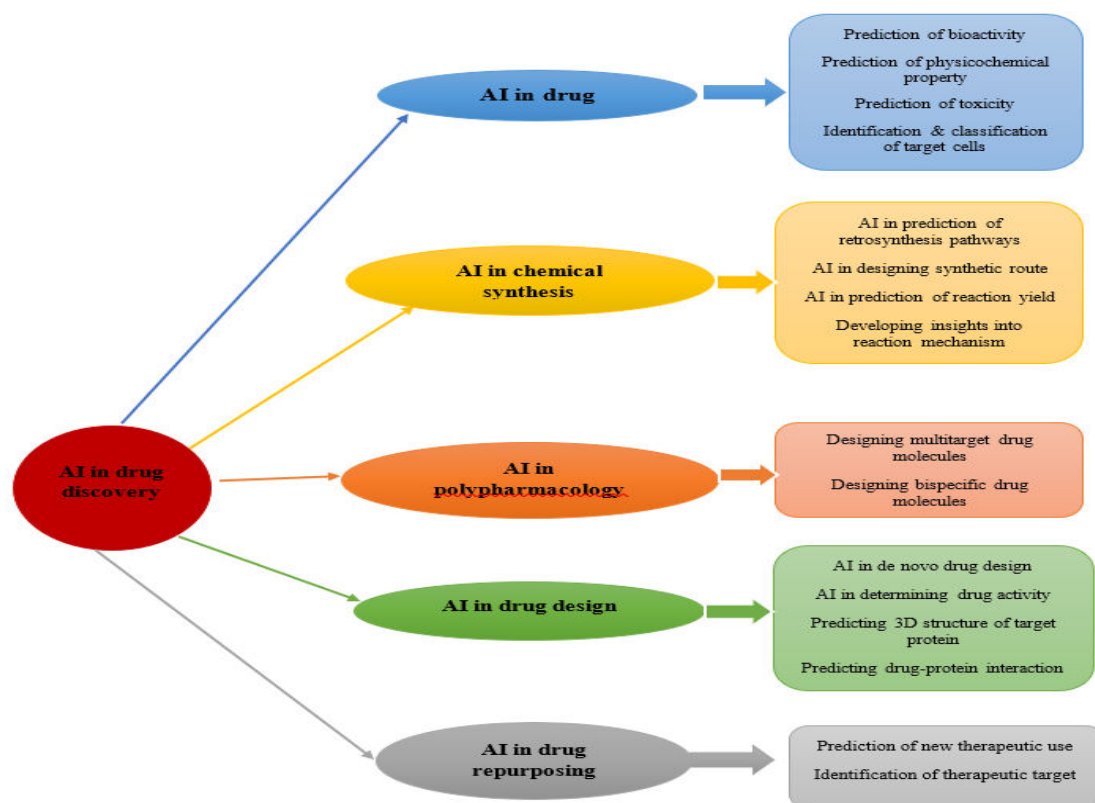


Figure 3: Artificial intelligence (AI) role in drug discovery.

### C. Prediction of Physicochemical Property

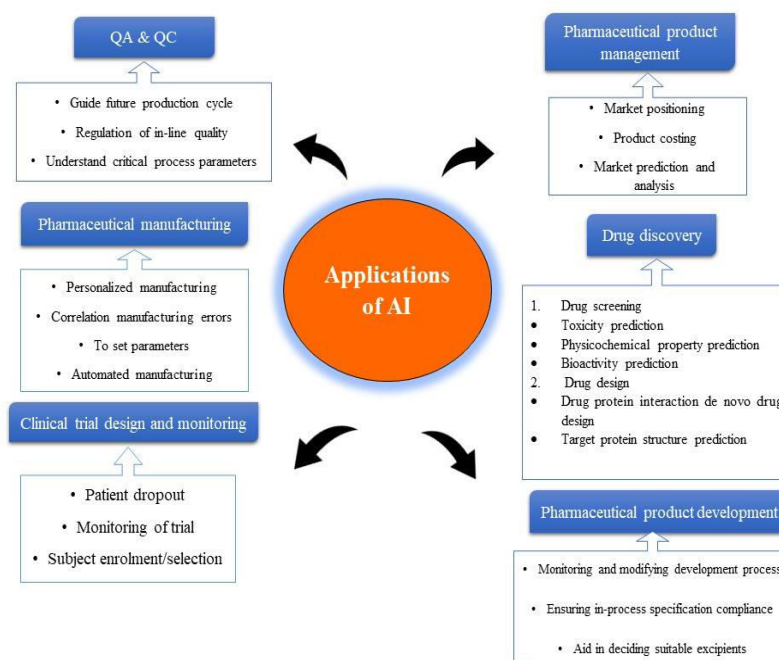
Physicochemical characteristics of the drug, such as solubility, partition coefficient (log P), degree of ionization, and intrinsic permeability, have an indirect effect on its pharmacokinetic properties and target receptor family and must thus be considered when developing new drugs creating a new drug. Various AI-based tools are available to forecast physical-chemical properties. For example, ML employs large data sets generated during compound optimization prior to training the program. Drug design algorithms include Potential energy descriptors, such as SMILES strings measurements, electron density around the molecule, and 3D atom coordinates to generate viable molecules using DNN and predict its properties as a result(7).

### D. Prediction of Toxicity

To avoid toxic effects, it is critical to predict the toxicity of any drug molecule. Cell-based in vitro assays are frequently used as preliminary studies, preceded by animal studies to determine a compound's toxicity, increasing the cost of drug discovery. Tox tree, Lim Tox, pk CSM, admet SAR, and other web-based tools are available to help reduce costs. Advanced AI-based approaches look for similarities between compounds or



project toxicity based on input features. The Tox21 Data Challenge, established by the National Institutes of Health, the Environmental Protection Agency (EPA), and the United States Food and Drug Administration (FDA), was a project to evaluate various computational techniques for forecasting the toxicity of 12 707 environmental compounds and drugs; an ML algorithm was used in this project.



**Figure 4:** Artificial intelligence (AI) applications in the pharmaceutical industry range from drug discovery to pharmaceutical product management

### E. AI in Repurposing of Drug

Deep learning technology based on cellular networks (deepDTnet) has been investigated to forecast the therapeutic use of topotecan, which is presently used as a topoisomerase inhibitor. It can also be employed to treat multiple sclerosis by blocking the human retinoic acid receptor-related orphan receptor-gamma t. (ROR-gt). The platform is currently protected by a provisional US patent. Self-organizing maps (SOMs) are a type of unsupervised machine learning (ML) that is used in drug repurposing. A ligand-based approach is used to find novel off-targets for a set of drug molecules by training the system on a set number of compounds with known biological activities, which is then used for compound analysis. DNN was recently used to repurpose existing drugs with proven activity against SARS-CoV, HIV, influenza virus, and 3C-like protease inhibitors in a study. To train the AI platform, extended connectivity fingerprints (ECFPs), functional-class fingerprints (FCFPs), and an octanol-water partition coefficient (ALogP -count) were used. Based on the findings, it was determined that 13 of the screened drugs could be advanced to the next stage of development due to their cytotoxicity and viral inhibition(8).

### F. AI in Development of Pharmaceutical Products

The role of artificial intelligence in pharmaceutical product development. The identification of a novel drug molecule necessitates its subsequent incorporation into a suitable dosage form with the desired delivery system characteristics. In this case, AI can take the place of the more traditional trial and error method approach. Problems can be solved using a variety of computational tools problems experienced in formulation design, such as stability issues, dissolution, porosity, and so on, using QSPR. Decision-support tools employ rule-based systems to select the best option depending on the type, nature, and quantity of excipients physicochemical properties of the drug and operate via a feedback mechanism for monitoring and modifying the entire process on an ongoing basis(9).

### G. AI in Manufacturing Pharmaceuticals

With the growing complexity of manufacturing processes, as well as the urging demand for efficiency and good product quality, modern manufacturing systems are attempting to impart human knowledge to machines, which is constantly changing manufacturing practice. AI integration in manufacturing has the potential to benefit the pharmaceutical industry. CFD, for example, employs Reynolds-Averaged Navier Stokes solvers technology to investigate the impact of agitation and stress levels in various equipment (e.g., stirred tanks), allowing for the automation of many pharmaceutical operations(10).

**H. AI in Quality Assurance Or Quality Control**

Manufacturing the required product from raw materials requires a careful balance of various parameters. Quality control trials on the products, as well as batch-to-batch consistency, necessitate manual intervention. This may not be the suitable approach in every case, highlighting the importance of AI implementation at this stage. The FDA modified Current Good Manufacturing Practices (cGMP) by instituting a 'Quality by Design' approach to comprehend the critical operation and specific criteria that govern the final quality of the pharmaceutical product(11).

**I. AI in Cost of Products**

The company finalises price of the product based on market analysis and expenses in the formation of the pharmaceutical product. The key in using AI to determine this price is to use its ability to copy the mentality of a human expert to assess the factors that control the cost of a product after it has been manufactured. The cost of branded and generic drugs is determined by factors such as drug research and development expenditure, strict cost regulation schemes in the country, length of the exclusivity period, market share of the developed drug after a year before patent expiry, price of the product, and price-setting policies(12).

**J. AI Application for Development Delivery Systems of Drugs**

In general, developing drug delivery systems has some drawbacks, such as predicting the relationship between formulation factors and responses. This is also linked to therapeutic outcomes and unanticipated events. The on-demand dose adjustment or the price of drug releasing, targeted releasing, and drug stability are important factors in the design of various types of intelligent drug releasing systems. In terms of self-monitoring systems for drug release, appropriate algorithms are important for controlling both the quantity and the duration of drug release. As a result, AI approaches can help predict drug dosing effectiveness and drug delivery promise in drug delivery dosage forms(13).

**6. AI Help In Hospital Pharmacy**

AI has so many applications in hospital pharmacy-based health care systems, including the organization of dosage forms for individual patients, the selection of appropriate or available administration routes, or treatment policies.

- a) Keeping of medical records: Maintaining patient medical records is a difficult task. The implementation of the AI system simplifies data collection, storage normalization, and tracing. The Google Deep Mind health project (created by Google) aids in the excavation of medical records in a short period of time. As a result, this work is beneficial for better and rapid health care. This project will help the Moorfields Eye Hospital NHS improve eye treatment (14).
- b) Assisting in repeating tasks: AI technology also helps in the detection and identification of diseases or disorders by examining radiology, ECHO, X-ray imaging, ECG, or other repetitive tasks. Medical Sieve (an IBM algorithm) is a "cognitive assistant" with strong analytical and reasoning abilities. A medical start up is required to improve patient conditions by relating deep learning and medical data. Each body part has a specialized computer program that is used in specific disease conditions. Deep learning can be used for almost any type of imaging analysis, including ECHO, X-ray, ECG, CT scan, or so on(15).
- c) AI help to health care system people: It has the ability to collect and compare data from social awareness algorithms. The large information recorded in the healthcare system includes the patients' medical history as well as their treatment history profile from birth, habits, and lifestyles(16).
- d) Treatment plan designing: AI technology allows for the development of effective treatment plans. When a patient's condition becomes critical and selecting an appropriate treatment plan becomes hard, the AI system is needed to control the situation(17).
- e) Health support and medication assistance: Since some years, the application of AI technology has been seen as efficient in health support services as well as medication assistance(18).

**7. IMPACT ON PHARMACY**

- As artificial intelligence (AI) automates routine, manual, and repeatable tasks, pharmacists' time and focus can shift to complex clinical tasks that provide direct, empathetic patient care in a high-touch, humanistic manner.
- AI systems have the potential to free up time by offloading time-consuming tasks like routine monitoring, patient and medication safety monitoring, and data processing.
- AI technology can work in the background to provide information in a visually digestible and easily interpretable format, assisting pharmacists in patient-care decisions(19,20.)

## 8. CONCLUSION

To conclude, the application of AI in pharmaceutical technology and drug delivery appears to be rich in promise and opportunity, the pharmaceutical industry's use of this technology is understandable. This study demonstrates AI's ability in the health-care industry. AI is becoming more useful on many levels, resulting in better and faster patient outcomes. Machine learning, artificial intelligence, and deep learning can assist us in providing proper care by assisting surgeries, diagnosing diseases such as cancer early on, and so on. This paper also highlights some factors to consider when conducting AI research. With recent advancements in AI research and government support or resources, operate of artificial intelligence within healthcare will increase significantly, with enormous potential for cost savings and improvement in healthcare quality of service.

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## A MIXTURE OF AUTOMATED AND MANUAL VEHICLES IN TRAFFIC ADAPTIVE CONTROL

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## ABSTRACT

Now a days mixture of autonomous and manual vehicles will continue as a part of many decades. Here, some of the safety issues regarding through over the mixture of autonomous and manual vehicles are entirely critical. Autonomous vehicles evince problems like low intention recognition rate and poor real-time performance when imagine the driving direction. Automatic vehicles having a map of upcoming surroundings based on variety of sensors are positioned at different parts of the vehicle. Radar sensors track the nearby vehicles position and send the information to the vehicle. Video cameras are detecting the traffic lights, road signs, look for pedestrians. In this paper we propose a mixture of autonomous and manual vehicles in traffic adaptive control. In this scheme automated vehicles have to be a safe and self-playing key role in traffic conditions. In this case, the driver's state is an important role along with low level intention might increase driver reaction time to take over control of the vehicle. Autonomous vehicles are having a lane change module is implemented in this paper. It is the main key role while in traffic. Automated driving vehicles are having some of the applications like robot taxis, automated commercial delivery trucks, passenger cars, smart forklifts and automated tractors for farming. Here, we provide implemented outputs along with raw images, and also obtained lane detection outputs through the python and OpenCV python software. Finally, we compose the guidelines and standards related to automation in driving methods along with limitations.

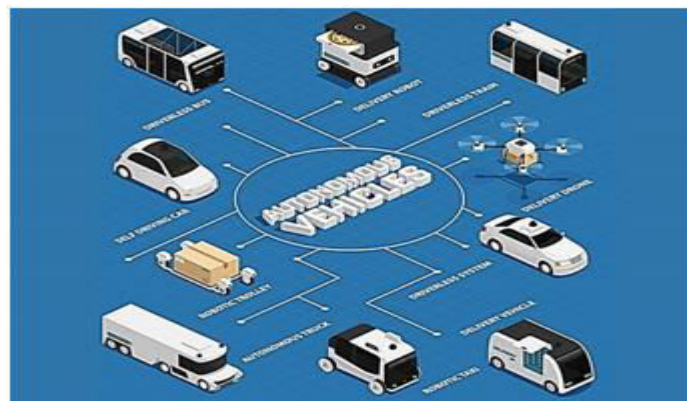
**Keywords:** Autonomous, Intention recognition, Lane detection, DDT, ADS.

## INTRODUCTION

Automated vehicles are approaching a level of majority that will be competitive along with the world through share roads with manual vehicles [1]. Manual vehicles and automated vehicles have the various capabilities shows different results in safety, security, management systems. They provide a latest service having different modes of transport and traffic management with respect to make safer, more coordinated and using the transport networks. The manual vehicles are not able to communicate each other electronically, because they have slow reaction based up on the human driver's intention.

The vehicles having some deviation in degree involving automated driving expect for years ago. The automated vehicles performing some works like transport people or goods from one place to another place with out human involvement. The fully automated vehicles have required many challenges applicable to their evolution and launch in the market, monitoring the driver behaviour in case of manual control needs to rehabilitate [9]. The steps which are introduced along with interpretation of the system potentiality, human role and system control, environment monitoring is depending up on various levels of automated driving.

To make sure the safety of the combined traffic system, the reliability of real time and autopilot accuracy controlling need must be improved [11]. The automatic recognition intentions of manually driven vehicles can reduce the number of accidents and traffic jams in combined traffic. The autonomous vehicle cooperation can be achieved in a decentralized manner to unloading data from resource with limited devices with low communications and low transmission costs.

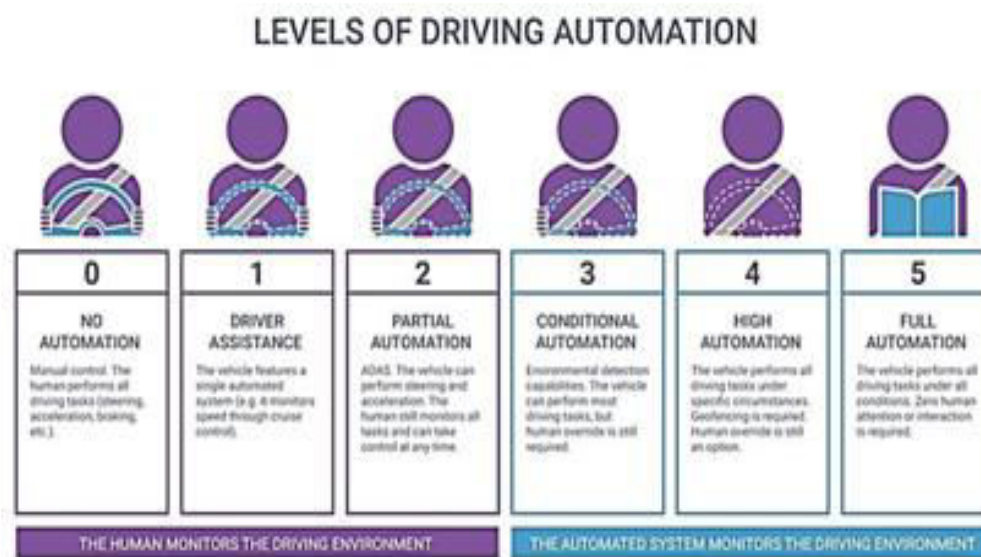


**Fig: 1 Source:** Autonomous vehicles must be a top concern for automakers – IEEE Spectrum Automated driving requires a computer vision discrimination module to understand and

Navigate the surrounding environment. The key role of this discrimination application amidst of other things as follows:

- To detecting Lane lines
- To detecting other objects like humans, vehicles
- Track the detecting objects suddenly moved on the road
- To predict their likely motion of the other vehicles

A good perception system should be able to do this in real-time operations and a variety of driving conditions – rain/snow, day/night, summer/winter etc. The main technology involves in computer vision mode which has become a powerful tool for sensing the surrounding environment and also used in many applications. In many studied systems [2], the lane detection consists of primitives such as road markings of the surface of painted roads. The presence of other vehicles on the same lane partially the road markings ahead of the vehicle presence of shadows caused by trees, buildings etc.



**Fig: 2 Source:** Levels of driving automation from Synopsys

### Lane Detection and Tracking Algorithms

To conduct a comparative and analysis of algorithms are in different three categories towards used: Features-based approach, model-based approach, and learning based approach. The Feature-based approach uses edges and visual characteristics like gradient, colour, brightness, orientation, texture, and variations on the road to radiance effects. The model-based approach is applicable to the latest road models for more feature that are against lighting effects, but the road shapes are too sensitive [8,9].

The Features-based approach is Image and sensor-based lane detection accomplishing processes and dependent on the various sensors which are mainly attached to the vehicle and output of the camera. The image frames are pre-processed, and a lane-detection procedure is applicable to crucial lane tracking. Generally, the sensor denoted values are used for lane markings for vehicle movement for the path following [10]. The steps which are involved in lane-keeping system are mapping, detection of lane marking.

The lane detection and tracking system are using an inverse projective mapping to create a bird's eye view of the road. Using Hough transform for detecting lane and Kalman filter can track that lane. The test images with vehicle are converted to grayscale for temporal blurring. The detected lanes are recognized by pair of parallel lines are separated through a distance. The mapping images are converted to binary and a Hough transform is performed on the binary image.

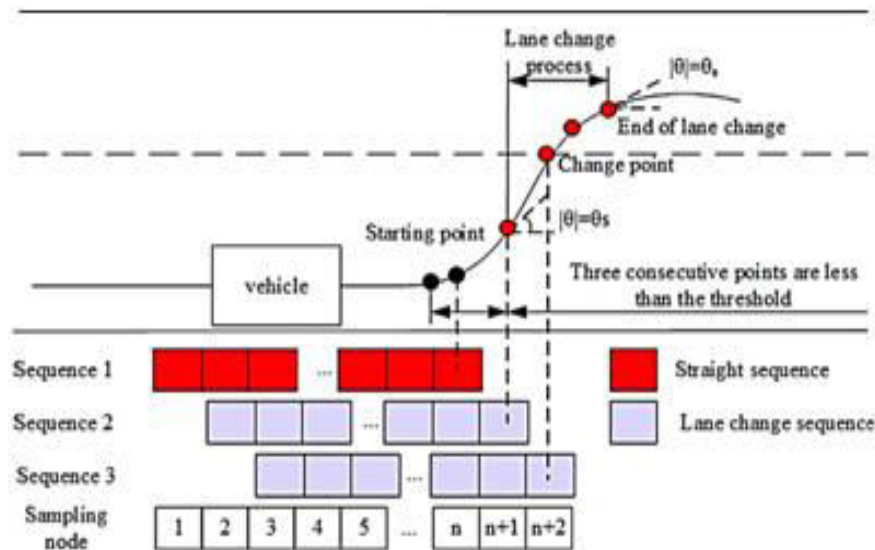
### RELATED WORKS

The driver intention of inner state can be varied by driving behaviour [3]. The beginning research on driver intention recognition has mainly focused on some of the operational strategies such as shifting and braking. The connection between traffic interactive system can be aggregates and analysing the real-time data from the inter connection of vehicles, infrastructure and decision making, good navigation, time and fuel resource, etc. The crucial Transformations are happened in automobile industry can be summarized as follows:



- ✓ A good Intelligent navigation system
- ✓ Road safety and traffic congestion services are improved
- ✓ Automated driving methodologies
- ✓ Public information on the road.

The Fuzzy method was used to recognize the intent of driver and MATLAB/Simulink based simulations of the fuzzy shift control strategy for automated driving intentions. The driver detecting the appearance of pedestrians in front of a vehicle, determined four driving intentions: acceleration, deceleration braking, turning and sharp turning. The driving intentions of other vehicles are categorized into two types: longitudinal vehicle driving intentions and lateral vehicle driving intentions.



**Fig: 3** Source: Recognition of lane-change model trace classification chart

The advantages of autonomous cars are as below:

- ✓ Reduce traffic crowding (30% fewer vehicles on the road)
- ✓ Improving traffic free, walkability and liveable.
- ✓ Free parking space for other uses like schools, parks and other public places.
- ✓ Reduce CO<sub>2</sub> emissions by worldwide in urban areas and metro cities.

## TEST DESIGN AND ANALYSIS

### A. Experimental Conditions and Data:

To verify the studied method of lane-change intention of recognition, we have conducted simulation experiments on the three driving intentions are left lane change, right lane change, lane keeping methods [6,7]. Lane detecting is the key role for self-driving vehiclesto achieve a fully automated mode. Finally, we obtained lane detection through Python and OpenCV Python software.

### B. Experimental Scheme:

After experimental data we need to develop a test plan and to conduct the performance analysis of the test results which are obtained from highway vehicle driving. To analyse the three methods of this proposed model are accuracy of each lane change intention of recognition, total average of recognition accuracy and various prejudgement times of recognition accuracy.

### C. Test Results:

After lane detection by using python and OpenCV python software along with Matplotlib (Matlab plot library). Outputs are obtained along with test images and later completed the code implementation will be given the accurate test images with outputs. Outputs are obtained like normal test image is changed into colour detection in straight roads, left curve roads and right curve roads.





**Fig: 4** Before lane detection on curve road



**Fig: 5** After lane detection on curve road



**Fig: 6** Before lane detection on left curve road



**Fig: 7** After lane detection on left curve road

## CONCLUSION

To reduce the number of accidents is the main goal. In United States, many vehicles are already equipped with new technology called advanced driver-assistance systems (ADAS). The technology advancements are leading to more efficient infrastructure for automated vehicles. The vehicle-to-infrastructure communication, allows the data exchange with the surrounding vehicles to share the data within the speed limits, traffic lights, signage, zebra crossing. It also manages the economy of fuel and collisions prevent. In generally, it will also pave the way for new challenges to social and ethical in nature, but also technical in nature. The analysis of detecting lane lines accurately and quickly for applications of automated driving in real time lane detection algorithm-based videos which is taken from a vehicle driving on highway along with images also taken was studied in these cases. The detected lanes were obtained using Hough transformation with restricted search area. The concerned lane detection algorithm can be applicable to both painted and unpainted road, as well as straight and slightly curved road.

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**CALCULATION OF POINT IN TIME PD FROM THROUGH THE CYCLE PD OF CORPORATES UNDER IFRS9**

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**Shruti Verma, Rahul Singh Bhatti, Vivek Kumar Kanaujia and Pritam Choudhury**

**ABSTRACT**

*Indian banks have to mandatorily borrow the new International Financial Reporting Standard (IFRS)9 (Ind AS 109). One of the major changes is the impairment of financial assets which will cover provisioning for the same. The earlier accounting method primarily led to provisioning grounded on incurred cost at the time of objective substantiation of impairment (90 days past due) which was conventional in nature (as per RBI guidelines).*

*IFRS9 approach demands early recognition of loss allowances grounded on credit quality (significant increase in credit risk) & considers forward-looking point in time (PIT) probability of Default rather than historical PD to measure loss allowances and therefore makes banks more in risk monitoring and better prepared for unborn events.*

*The focus of this research is to explore some of the methodologies to estimate forward-looking Point in time (PIT) PD from Through the cycle (TTC) PD which is calculated using credit rating and default data taken from credit rating agencies.*

*The probability of Default (PD) is a quantified measure of credit risk. To assert whether there's a significant increase in credit risk or not, Banks need to compare PD at the original recognition of financial assets and PD at the reporting date. IFRS 9 demands that PD at reporting date should incorporate forward-looking information and should be sensitive to the profitable cycle. Hence, banks need forward-looking Point-In-Time (PIT) PD. Credit rating agencies give Through the Cycle (TTC) PD which is grounded on historical Default rates and equaled out over a given period so it nullifies the effect of the profitable cycle. So, we've deduced PIT PDs from historical TTC PDs and also we've adjusted these historical PIT PDs to make them forward-looking PIT PDs using regression analysis.*

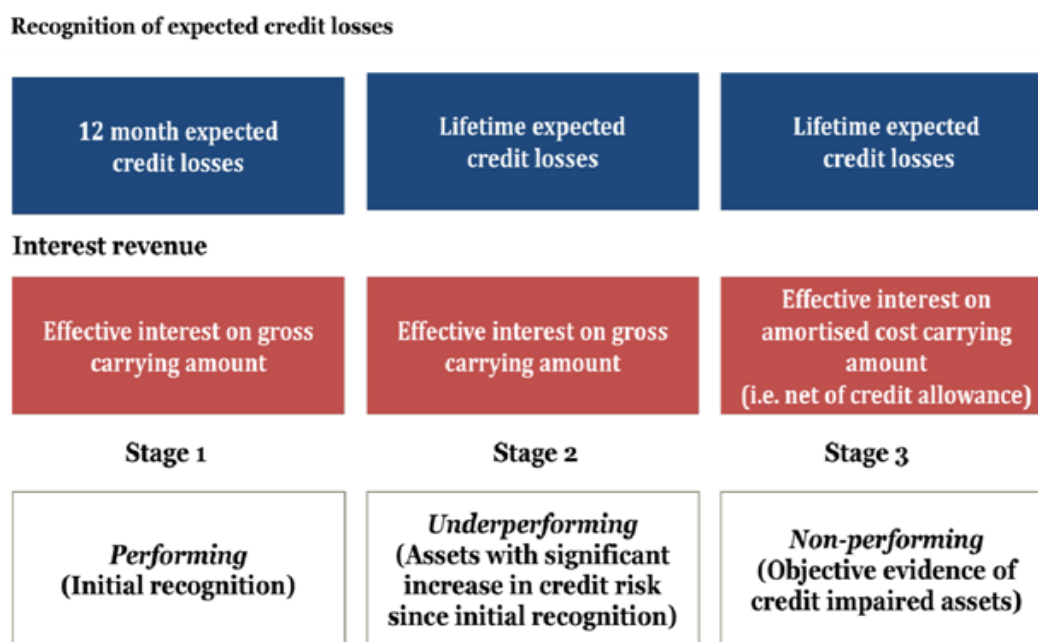
*IFRS 9 also recommends using continuance PD over the remaining life of an instrument while assessing a significant increase in credit risk since original recognition. It should be noted that while using continuance PD for an assessment, continuance PD at original recognition cannot be directly compared with continuance PD on the reporting date. The comparison should be made between continuance PD on the reporting date and continuance PD of remaining life on the reporting date calculated at the time of original recognition. PDs for the same ages should be compared.*

**Keywords:** Probability of Default, IFRS-9, PIT, TTC

**INTRODUCTION**

**There are 2 types of PDs used for calculating ECLs:**

- 12 –month PDs –This is that the estimated probability of default occurring within the next 12 months (or over the remaining life of the financial instrument if that is less than 12 months).
- Lifetime PDs– this is often the estimated probability of a default occurring over the remaining life of the financial instrument. This is often used to calculate lifetime ECLs for “stage 2”.
- PDs could also be broken down further into Marginal probability of default (MPDs) for sub-periods within the remaining life. To work out lifetime PDs, the bank can build from the 12-month PD model. For this, it develops lifetime PD curves or term structures to reflect expected movements in default risk over the lifetime of the exposure.

**Credit Expected Loss (CEL) Model****Impairment of Financial Assets.**

There are 2 approaches,

**1. Simplified approach:** Applicable to lease receivables and trade receivables (mandatory for those receivables having no significant financing component and optional for those receivables having a big financing component) where expected credit loss is taken as lifetime loss. This approach is applicable mostly to companies and doesn't find its use in the banking sector.

**2. Generalized Approach:** it's a dual measurement approach having 3 stages for recognition of impairment based on the credit quality since inception.

**Stage 1**

It includes financial instruments that don't have a significant increase in credit risk since initial recognition or have "low credit risk" at the reporting date. For these assets, 12-month expected credit losses (ECL) are calculated & used for provisioning. Interest revenue is calculated on the gross carrying amount of the asset (i.e. without deduction for credit allowance). 12-month ECL is that the expected credit losses that result from default events that are possible within 12 months after the reporting date. It's not the expected cash shortfalls over the 12-month period but the entire credit loss on an asset-weighted by the probability that the loss will occur in the next 12 months. Example: Consider a company borrower whose rating grade did not change on reporting date from origination date or we can say there is no increase in PIT forward-looking PD or slight increase in PD which is not significant as per bank policies. Macroeconomic conditions are good and therefore the industry is also performing well then such borrower is classified in Stage 1 and we calculate 12-month ECL.

**Special Condition**

Low credit risk exception: If a borrower features a strong capacity to meet contractual cash flow obligations in the near term, adverse changes in economic and business conditions within the longer term may, but won't necessarily, reduce the power of the borrower to fulfill its contractual cash flow obligations can be classified as low credit risk. The loans extended to Government can also be classified as low credit risk.

**Stage 2**

It includes financial instruments that have had a big increase in credit risk since initial recognition but for which objective evidence of impairment (default) is not applicable. For these assets, lifetime ECL is calculated and used for provisioning, but interest revenue remains calculated on the gross carrying amount of the asset. Expected credit losses are the weighted average credit losses with the probability of default (PD) as the weight. Example: Suppose the telecom industry is passing through a stressed period such that there is a significant decrease in profitability at the industry level. So, a borrower from the telecom sector whose market share is high is probably going to face decreased level of profitability and PD has increased significantly then we will calculate lifetime expected credit loss rather than 12-month ECL though the borrower may not have defaulted on its existing debt obligations.

### Special Condition

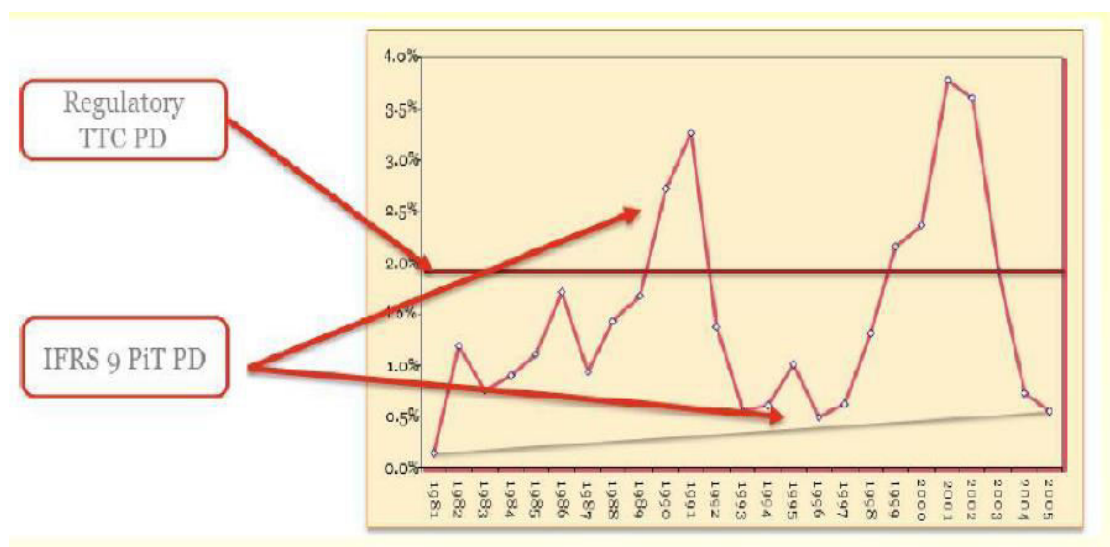
Rebuttable presumption: IFRS 9 contains a rebuttable presumption that the condition for recognizing lifetime expected credit losses is met when payments are quite 30 days past due. This presumption isn't an absolute indicator but is presumed to be the latest point at which lifetime ECL should be recognized even when using forward-looking information. The presumption are often rebutted only if the bank has reasonable and supportable information demonstrating that even if contractual payments are more than 30 days past due, it doesn't represent a significant increase in credit risk. Example: Sometimes borrower miss to pay the EMI on time and 30 days are passed due then as per standard, lifetime ECL is calculated. But if the bank can justify with evidence that EMI was missed due to some technical problem or the borrower was on a foreign trip and not due to a change in its financial condition then the bank can rebut the assumption.

### Stage 3

It includes financial assets that have objective evidence of impairment i.e. those assets that became non-performing assets (NPA) and stressed assets at the reporting date. For these assets, lifetime ECL is recognized and interest revenue is calculated on the net carrying amount (net of credit allowance). Example: When the loan becomes NPA or there's no payment of interest and principal for more than 90 days we calculate lifetime ECL and interest revenue is calculated on a net basis (i.e. deducting provisions from the gross carrying amount of the loan).

### IFRS 9 vs. Basel IRB PD

IFRS 9 clearly emphasizes all the knowledge used should be forward-looking and must incorporate current economic conditions. It also states historical information should be used, but adjusted to reflect current conditions. Hence, it's clear that PD must reflect current economic conditions and need not be TTC or adjusted for a downturn, as within the case of Basel IRB rules. PDs used under the Basel IRB framework are through-the-cycle (TTC) PDs, whereas, under the IFRS 9 framework, we'd like point-in-time (PIT) PDs. By accounting for the present state of the credit cycle, PIT measures track closely the variations in default and loss rates over time. For calculation of capital buffer against unexpected losses, the through-the-cycle PD (unconditional of the states of the economic cycle, PD) should be utilized in the RWA formulas.



The 12-month PD used for regulatory purposes (Basel) should be adjusted for IFRS 9 usage. PD used for IFRS 9 should be point in time (PIT) probabilities (i.e., prob. of default in current economic condition). Under the Basel IRB approach, PD is calculated through the cycle and estimates are less sensitive to changes in economic conditions. Therefore, Basel PD reflects long-term trends in PD behavior as against IFRS 9 PIT PD. As a result, during a benign credit environment, IFRS 9 PIT PD is going to be lower than the regulatory PD (TTC), while the adjustment is going to be the opposite during a financial crisis.

### TTC vs. PIT PDs

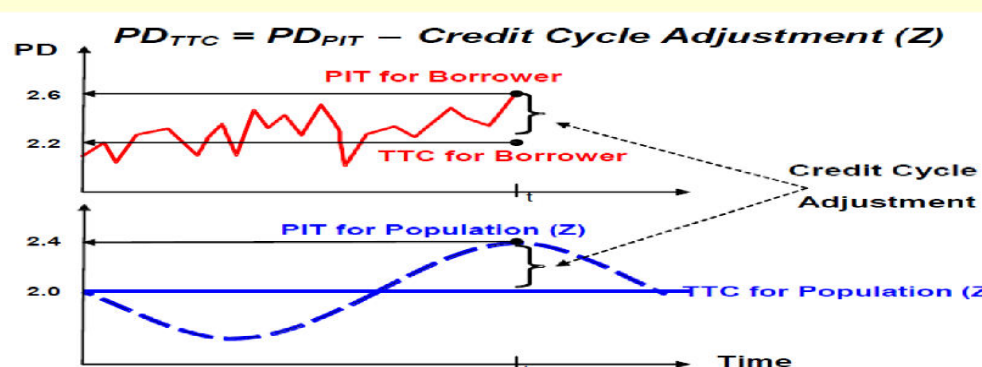
From a risk-mitigation standpoint, it's not only default risk for today or tomorrow that has to be forecasted. For buy-and-hold strategies (follow-up & monitoring) what matters is default risk any time until the horizon of the underlying credit instruments. Hence, an appropriate credit assessment should in theory not just be limited to a PD at a given horizon, but also reflects its variability (transition & volatility) through time and its sensitivity to changes within the major factors affecting a given company. Therefore, one must consider not only a short-term PD but also the estimated trajectory of this PD over an extended horizon.



An accurate PIT PD describes an expectation of the longer term and incorporates all idiosyncratic effects and all relevant cyclical changes. Thus, a PIT PD corresponds to the standard meaning of “probability of default” and is unconditional concerning unpredictable factors. An obligor’s PIT PD is often expected to change rapidly as its economic prospects changes. During the economic expansion, the unstressed PD declines, and therefore the obligor receives a higher rating. During the economic recession, the unstressed PD increases, and therefore the obligor receives a lower rating. PIT PDs Can Generate Large Swings in Required Capital. A through-the-cycle (TTC) credit risk measure primarily reflects a borrower’s long-run, enduring credit risk trend. Compared to PIT risk measures, TTC risk measures display much less volatility and pro-cyclicality over the cycle. TTC PDs, in contrast to PIT PDs, reflect circumstances anticipated over a particularly long period in which effects of the credit cycle would average close to zero. The Internal Rating Based Approach (IRB) under pillar1 of the capital adequacy framework advocates the use of risk measures with through-the-cycle orientation to satisfy regulatory capital requirements.

Stability is seen as a desirable attribute of strategic capital reserve. A through-the-cycle (TTC) philosophy group obligors consistent with stress-scenario or long-run default probabilities. The difference: Broadly, point-in-time technique try and produce ratings that are responsive to changes in current business conditions while through-the-cycle systems attempt to produce ordinal rankings of obligors that tend not to change over the business cycle.

### PIT vs. TTC Adjustment



### LITERATURE REVIEW

Dr. Barry Belkin, Dr. Stephan Suchower, and Dr. Lawrence R. Forest, Jr. in their paper “a one-parameter representation of credit risk and transition matrices”(1998) stated that creditworthiness is often divided into 2 components

- (1) An idiosyncratic component Y, unique to a borrower, and
- (2) A systematic component Z, So Z measures credit cycle impact hence it's also called credit cycle index. They propose a way to derive this index using a transition matrix provided by rating agencies like “Moody’s” and “Standard & Poor”. The cycle index was found to be negative in periods of contraction and positive in expansions. The cycle index was positive when the present default rate is lower than the average default rate. In periods of contraction, the reverse was true.

Scott D. Aguas, Lawrence R. Forest Jr, Martin King, “Marie Claire Lennon, and Brola Lordkipanidze in their Paper “Designing and Implementing a Basel II Compliant PIT–TTC Ratings Framework”(2008) explained a way to move between the TTC and PIT PD by using a credit cycle index which is in line with the one-factor Merton model. They used the concept of distance-to-default to rework a TTC PD into a PIT PD. They said “synthetic” distance-to-default (DD) is often obtained by applying the inverse of the Standard normal cumulative function to PDs and this distance-to-default (DD) is used to find the credit cyclic index.

In one white book published by MOODY Analytics knowledge Service on IFRS 9 Impairment Modeling Regulatory Perspectives & Modeling Approaches provide methods to convert TTC PDs to PIT PDs using the Z index method and also provides some guidelines to assess the many increases in credit risk.

The paper states that the TTC transition matrix is often represented by a normal distribution and by shifting the mean of the normal distribution by Z (credit cyclic index), we will obtain the PIT transition matrix.

Anderson, Sweeney, Williams, Camm, and Cochran in their book titled “Statistics for Business & Economics” state a statistical test to match two proportions using one-tailed hypothesis testing. Using this test, we will assert with a certain level of confidence (say 95%) that one proportion is significantly greater than the other statistically. They have stated test statistic formula and if the value of the test statistic is greater than or equal to the critical value at a given confidence interval, then we will reject the null hypothesis of one proportion being equal or less than the other proportion and accept the alternative hypothesis that one proportion is significantly greater than the other proportion statistically.

## METHODOLOGY

This chapter describes basically about Objective of the study, Sources of information, sample data, technique, tool & methodology, etc.

### Objectives

This study will help to highlight the following points:

- How corporate rating helps the bank to access credit risk and in taking preventive measures.
- To measure yearly PD by using a transition matrix.
- To find trends in ratings annually.
- To estimate annual industry-wise PD for IG, NIG, and overall.
- To understand how the Default rate is affected by macroeconomic variables by calculating the z-factor which incorporates macroeconomic variables

### Source of data

The study involves the usage of secondary data. **Long-term bank loan rating data of large corporates is collected which is published by rating agencies CRISIL** and Industrial classification data is computed with the help of **proress iq software**.

### Sampling

A random sample of **3606 companies is taken for 10 years (i.e. From 2012 to 2021)**. The objective is to cover the PIT economic cycle and to collect considerable data samples of firms to run the analysis. The sample so taken is a mixture of companies from all industries to achieve the objective of the study.

### Technique, Tools & Methodology

It uses the **transition matrix approach for measuring PD**.

The long-term loan rating thus collected (as discussed above) are grouped into AAA, AA, A, BBB, BB, B, C, and D (ignoring the signs “+” or “-“).

After grouping the data into these ratings 7 cohorts are made in excel using a pivot table.

Corporate PD is estimated by analyzing rating transitions over time. In this study mortality rate analysis of one cohort of corporates to find no. of firms in each rating class (or industry) in each cohort moving towards default (D).

The Average one-year default probabilities are obtained by weighted average where the weight represents the relative importance of each year as given by the cohort size for each rating grade at the beginning of each year.

The one-year default frequency (DF) of the i-th rating grade (or industry) is given by:

$$DF_i = \frac{T_{i,D}}{N_i}$$

The average historical one-year default probability (also known as the expected default probability or expected default frequency) for the i-th rating grade or industry (PDI) is obtained by weighted average:

$$PD_i = \sum_{t=1}^n w_i^t \frac{T_{i,D}^t}{N_i^t}$$

$$w_i^t = \frac{N_i^t}{\sum_{s=1}^n N_i^s}$$



- After calculating MPD (The year wise PD's for different rating grades are estimated by counting the number of defaulting companies in a yearly transition for each grade and dividing by the total number of corporates in that grade at any point during the year) by doing the average one-year migration matrix is constructed.
- By using it one can calculate slippage rate as well as can access credit rating at a given horizon (PD).
- Also, the study involves finding upgradation and down gradation rates over time and the annual downgrade to upgrade ratio.
- Further, the companies have been classified into various industries with the help of the prowess database and then these companies have been grouped into major 14 industries which are auto & parts, chemicals & Pharmaceuticals, Engineering, construction engineering including electronics, financial services, FMCG, foods & products, infrastructure, Jewellery, Non-Financial services like IT & other services like transport, hotels, healthcare, leather, Rubber, Plastic & products, metal & products, nonmetals, paper & products, textile, etc.
- While classifying and grouping these companies into these major 14 industries we have kept in mind that there should be enough companies falling under each category of industry or otherwise, the company should be classified as others or they should be grouped under major subgroup. Due to less company falling under IT, it has been categorizing as Non- Financial Services also Leather, plastic and rubber have been grouped as one industry type, etc. This is done to ensure that the results thus generated are correct and reliable to conclude.
- Later after classifying these corporate into various industries, we subdivided each industry group into investment grade(IG) as well into non-investment grade(NIG) using their long-term loan rating to estimate average industry-wise average PD for IG, NIG, and overall. Investment grades are AAA, AA, A BBB, and non-investment grade are BB, B, and CCC (also called junk bonds).
- Graphical representation is done to understand how the Default rate is affected by Economic factors like GDP growth rate, credit growth rate & Current account deficit (CAD as % of GDP) by using software like Eviews. Regression, when run by taking the **default rate as a Dependent variable and the rest of the variables as independent variables**, is giving improper results as the period of the data needs to be longer than one business cycle; otherwise, the model would not capture the impact of the business cycle on probabilities of default. (this is one of the limitations of macroeconomic models).
- By estimating PIT PD from external credit rating and running a regression against **forecasts of macroeconomic variables**/and/or signals from the equity market. Forward-looking PIT PD can be determined.
- Another option for incorporating forward-looking information into an existing PD is to use a stress testing approach, where the projected PD depends upon economic scenarios.
- Macroeconomic data can be extracted from the RBI database for the Indian economy.

### Conversion of TTC PD to PIT PD

To convert TTC PD into PIT PD, we will use **Z-indicator system**. Z- indicator represents single methodical factor which incorporates macroeconomic condition at that point of time. As per description, TTC PD isn't affected by methodical factors while PIT PD varies with methodical factors. Merton model states that inverse standard normal cumulative distribution of PD represents the distance to default (DD). So, if we take the difference between the inverse standard normal cumulative distribution of TTC PD and inverse standard normal cumulative distribution of PIT PD, we get Z indicator which is a reflection the of profitable condition.

Long Run Default Rate (TTC- PD) of a particular time is calculated by taking ten years average default rate up to previous year of that year & Z value for through the cycle PD is calculated by,  $TTC\text{-}Odd = \ln(\text{Good}/\text{Bad})$  i.e.  $\ln\{(1-\text{bad})/\text{bad}\}$ , PIT- PD for a particular time is taken as that time's periodic Default rate & corresponding Z value is calculated also.

Z- Shift is calculated by abating TTC-Odd from PIT-Odd.  $Z(\text{Credit Cycle}) \text{ Index} = DD\text{ TTC}t - DD\text{ PIT}t$

$TTCt - \phi^{-1}(TTC\text{ PD}t) - DD\text{ PIT}t - \phi^{-1}(PIT\text{ PD}t)$

$\phi^{-1}$  - Inverse standard normal cumulative distribution

**Linking Z-indicator (Credit Cyclic indicator) with macro profitable variables using regression analysis.**

The reliance of Z Index with different macroeconomic variables is being analyzed by taking Z indicator as dependent variable and macroeconomic factors as independent variables. Depending upon the p- value of beta measure of different macroeconomic variables is attained by regression analysis whether a macroeconomic variable has any significant relation with z indicator or not. If p- value is lower than 5 also there's a statistically significant relation between the z indicator and macroeconomic variable.

Cumulative PDs can be attained by using Markov property. It states that the probability of an object enwrapping any given future state depends only on its current state. By using this property, forward PDs can be assumed to be functions of current PDs only. Forward PDs can be erected by simple matrix addition of standing transition matrices. By this explanation, transition matrix for time 2,  $M_2 = (M_1).2$  and also, transition matrix for time 3 is given by  $M_3 = (M_1).(M_2)$  and so on. This system can be used for construction of continuance PDs. From Forward looking PIT- PD Cumulative- PD of forthcoming times can be calculated by using Markov "s Rule. From this PIT- PD (MPD) for each time can be calculated.

### To Assess Statistically Significant Increase in Credit Risk Under IFRS9

To assess significant increase in credit risk, we need applicable, time harmonious similar continuance PD. This can be explained using an illustration, suppose a fiscal instrument has a maturity period of 5 times and 3 times are left (before it matures) as on the reporting date, also while comparing continuance PD, we'd have to compare continuance PD for the remaining 3 times and not 5 times calculated at fabrication date with 3- time continuance PD at reporting date. thus, we will need to cipher time harmonious similar continuance PD for fiscal instruments. similar Continuance PD can be deduced in following manner, First, we gain continuance (Cumulative) PD using Markov rule, also we decide 12- month( borderline) PD from it using the following formula,

$$(1 - CPD_n) = (1 - CPD_{n-1}) \times (1 - MPD_n)$$

Where,  $CPD_n$  – Cumulative probability of Default till utmost time

$CPD_{n-1}$  – Cumulative probability of Default till (n- 1) th time  $MPD_n$  – Borderline Probability of Default of utmost time.

Once we've MPDs, we will use applicable (similar period) MPDs to calculate similar CPD. 5- time forward-looking CPD at the reporting date is attained using the Markov principle and compared with 3- time similar CPD at the fabrication date.

## ANALYSIS & INTERPRETATIONS

### 1. Thus One-Year Average TTC PD Is Calculated by the Transition Matrix.

ONE YEAR AVG TM	AAA	AA	A	BBB	BB	B	C	D	Total
AAA	95.83%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
AA	2.27%	68.18%	25.00%	4.55%	0.00%	0.00%	0.00%	0.00%	100.00%
A	1.09%	13.04%	54.35%	26.09%	3.26%	1.09%	0.00%	1.09%	100.00%
BBB	0.00%	0.59%	13.27%	53.10%	26.55%	2.06%	0.59%	3.83%	100.00%
BB	0.00%	0.33%	0.33%	21.19%	49.67%	13.25%	0.00%	15.23%	100.00%
B	0.00%	0.00%	0.00%	1.57%	34.65%	30.31%	3.94%	29.53%	100.00%
C	0.00%	0.00%	0.00%	4.88%	2.44%	31.71%	4.88%	56.10%	100.00%
D	0.00%	0.00%	0.00%	0.00%	7.84%	76.47%	9.80%	5.88%	100.00%

### 2. Z index Calculation & Linking Z index with Macroeconomic Variable:

Macroeconomic variables like GDP growth Rate, Inflation & Unemployment Rate, (2009-2020) were taken as independent variables, and these variables are regressed with the dependent variable Z-Index. The regression result is as follows.

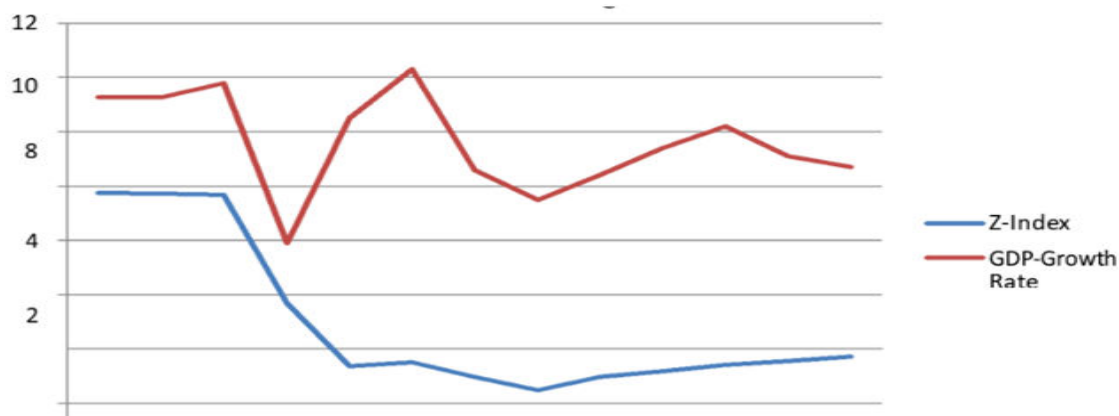
	Coefficients	Standard Error	t Stat	P-value
Intercept	-27.76916927	3.352738308	-8.282534072	1.67569E-05
GDP-GR	43.6101957	16.58465456	2.629551043	0.027378799
Inflation	10.75834731	10.10549276	1.064603931	0.314782479
Unemp-Rate	69.73451049	8.941641352	7.798848975	2.71132E-05

Regression Statistics	
Multiple R	0.949637887
R Square	0.901812116
Adjusted R Square	0.869082822
Standard Error	1.02305723
Observations	13

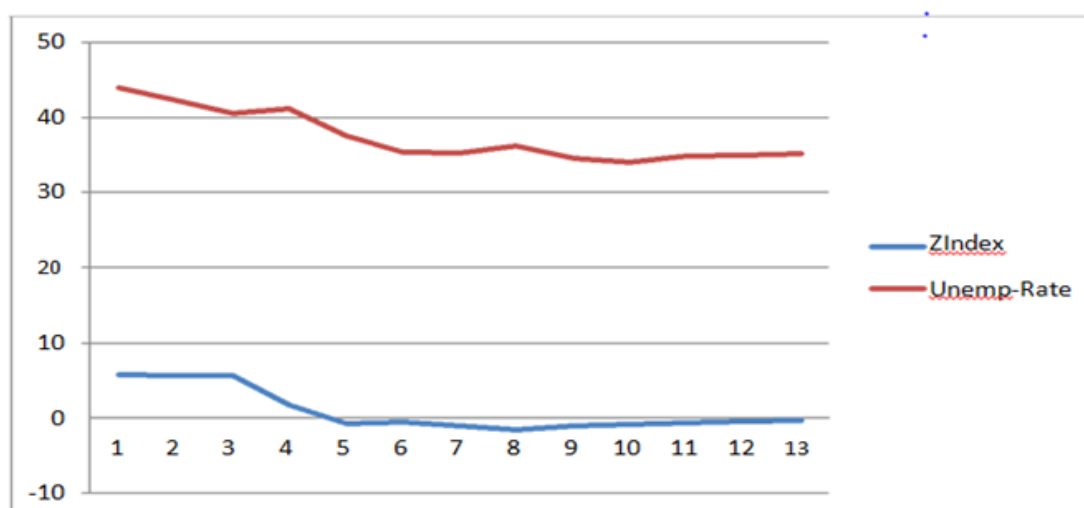
Regression result showed that for a 95% confidence interval inflation has statistically insignificant relationship with Z-Index, where as both GDP-Growth Rate & Unemployment Rate have statistically significant relationship with Z- Index. So Inflation Rate was dropped & again regression was run between Z- Index with GDP-Growth Rate & Unemployment Rate. The result is as follows.

	Coefficients	Standard Error	t Stat	P-value
Intercept	-28.4215242	3.318176282	8.565405147	6.44284E-06
GDP-GR	41.80233366	16.60714435	2.517129543	0.030537203
Unemp-Rate	69.95269558	8.998711692	7.77363449	1.51272E-05

Regression Statistics	
Multiple R	0.943105079
R Square	0.88944719
Adjusted R Square	0.867336629
Standard Error	1.029857477
Observation	13



It is obvious that both the independent variables have statistically significant (coefficient) relationship with Z-Index which can be very well observed from the p-values of the coefficients ( $<0.05$ ) i.e. Z-Index reflects economic condition.



So, the estimated Z-Index is as follows:

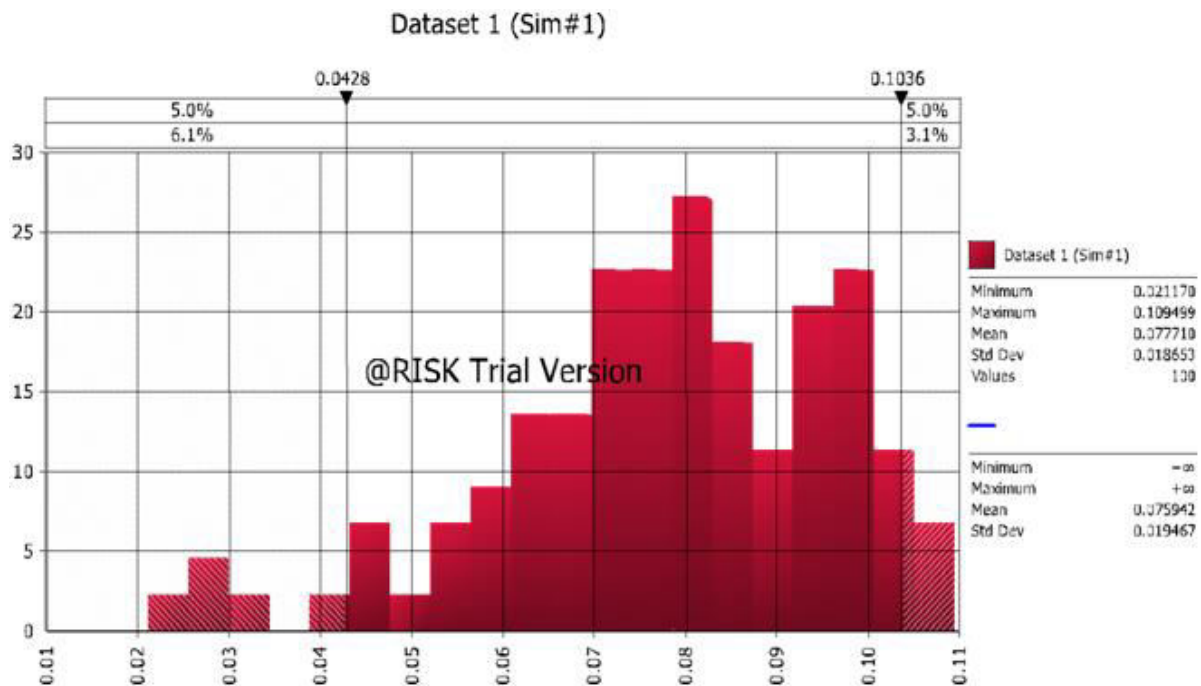
$$Z = -28.4215242 + 41.80233366 * \text{GDP-GR} + 69.95269558 * \text{UN-EMPR}$$

It was also observed that during crisis period & post crisis period the Z-Index had become negative & it gradually improved, the similar pattern was also observed in GDP-Growth Rate & Unemployment Rate like when Z-Index was deteriorating the GDP-Growth Rate was declining & Unemployment rate was also worsening, whereas while Z-Index was improving the GDP-Growth Rate & Unemployment rate were getting better.

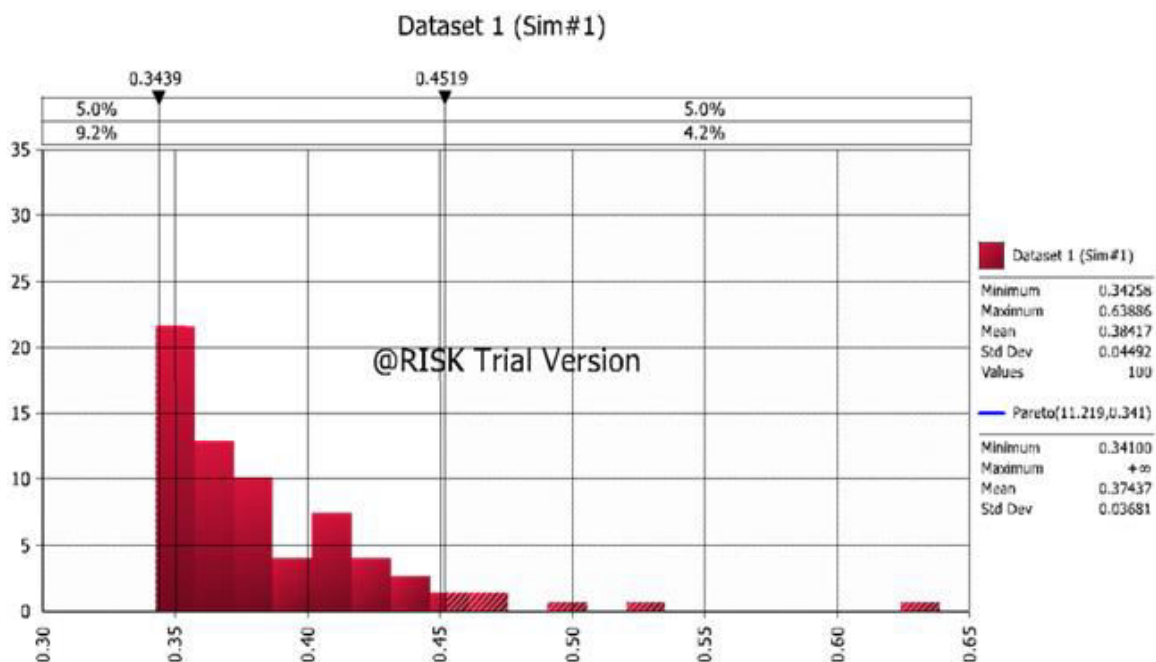
### 3. Generating scenarios for one year forward macroeconomic variable:

Monte Carlo simulation is used to fit a distribution to GDP growth rate & Unemployment Rate and it was found that GDP growth followed a negatively skewed distribution & Unemployment-Rate shows a Pareto distribution as shown in the figure. Monte Carlo Simulation was used in **AtRisk** software to generate 100scenarios of one year forward-looking GDP growth rate & Unemployment Rate and mean value was taken to estimate unbiased one year forward GDP growth rate & Unemployment Rate respectively.

#### Growth Rate



#### Unemployment-Rate



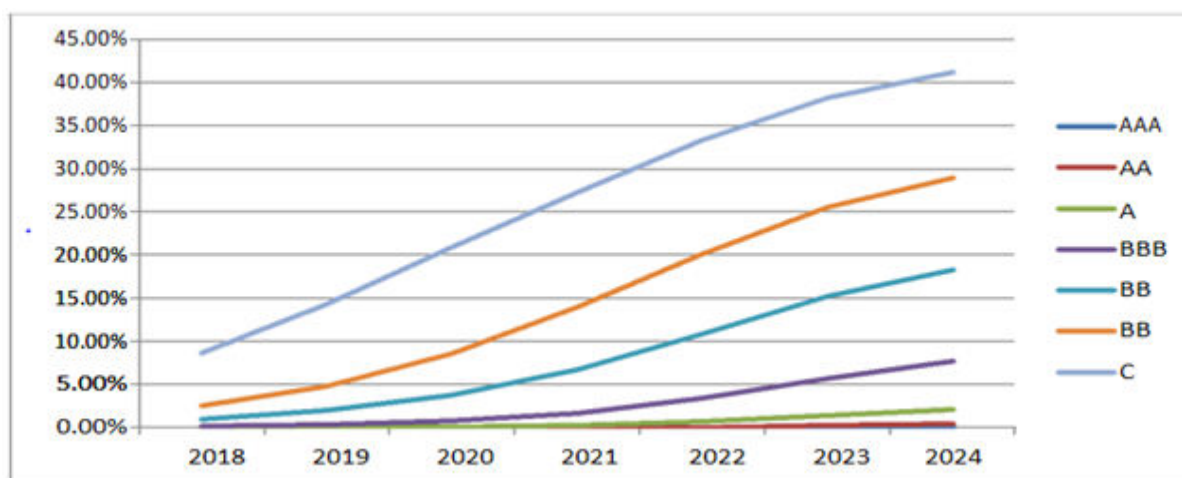
This results helped us to forecast 1 year forward Z-Index from the formed regression equation which includes a full economic cycle. The Z-Index evaluated was 0.5. This value was used to estimate 1-year forward looking PIT- PD matrix from TTC-PD which is shown as below.

2012-2021 PIT-PD	AAA	AA	A	BBB	BB	B	C	D
AAA	96.65%	5.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AA	2.87%	71.66%	28.28%	5.58%	0.00%	0.00%	0.00%	0.00%
A	1.41%	15.28%	58.29%	29.44%	4.06%	1.41%	0.00%	1.41%
BBB	0.00%	0.78%	15.54%	57.05%	29.93%	2.62%	0.78%	4.74%
BB	0.00%	0.45%	0.45%	24.20%	53.65%	15.51%	0.00%	17.71%
B	0.00%	0.00%	0.00%	2.01%	38.40%	33.89%	4.87%	33.07%
C	0.00%	0.00%	0.00%	5.98%	3.07%	35.35%	5.98%	60.00%
D	0.00%	0.00%	0.00%	0.00%	9.41%	79.43%	11.65%	7.15%

Using one year forward looking PIT transition matrix, we derive term structure of PD for different rating grade using Markov rule. It is tabulated below,

### Term Structure of PD

CPD	2018	2019	2020	2021	2022	2023	2024
AAA	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.09%
AA	0.00%	0.01%	0.02%	0.04%	0.11%	0.27%	0.48%
A	0.04%	0.08%	0.16%	0.34%	0.72%	1.42%	2.10%
BBB	0.19%	0.40%	0.83%	1.72%	3.39%	5.77%	7.75%
BB	1.03%	2.01%	3.80%	6.78%	10.90%	15.24%	18.28%
B	2.60%	4.88%	8.66%	14.03%	20.17%	25.56%	28.98%
C	8.73%	14.34%	20.91%	27.30%	33.29%	38.21%	41.25%



➤ Also the PD for IG and NIG have been calculated



➤ And the transition matrix for movement from IG to NIG

2009-2018	IG		NIG		D
IG		76.55%		20.64%	2.81%
NIG		12.06%		63.82%	24.12%
D		0.00%		94.12%	5.88%

### Results

➤ So, we have found that in PIT PD percentage for movement from one rating grade to another has increased while IG grades have shown a higher percentage of stability.

- Companies that have been downgraded have more chance of getting defaulted.
- Movement from default to NIG is showing the early warning signal
- There is a high chance of NIG grade to get default.

## **CONCLUSION**

Impairment Loss Methodology of Ind AS 109 brings in new accounting concepts and global best practices which will undoubtedly enhance the quality of financial information and enable timely and adequate recognition and quantification of credit losses in the financial statements. A principle-based standard calls for significant management judgment and estimation using advanced techniques. So, it becomes the need of the hour to invest in developing advanced methodologies to make systems adaptable to new standards.

IFRS 9 provides limited guidelines to assess the significant increase in credit risk. Banks need to develop their policies and guidelines to assess the significant increase in credit risk. When banks adopt statistical test to assess the significant increase in credit risk, they can justify its method to the regulator in a scientific way as the margin of error and confidence level is attached to this assessment. While other quantitative methods like absolute change or relative change in credit quality pose an issue of justifying arbitrary percentages to the regulator. Hence, this statistical technique will help bankers solve one of the major issues of the implementation of the ECL provisioning framework of IFRS 9.

In a rule-based highly prescriptive reporting environment like India, there's a need for a change in mindset among the bankers, auditors, and other stakeholders. But this issue isn't insurmountable in the present economic and political scenario. Effective and efficient implementation necessitates partnerships with experts outside the standard accounts/finance department and changes have to be made to enterprise-wide data systems and framework. Banks, therefore, have to gear up for the final execution of applying these new standards in their accounting as well as credit risk departments. because the IFRS 9 guidelines are principally based, it don't provide rule-based solutions to many questions and hence poses different challenges for bankers to implement the ECL provisioning framework. within the project, i've got attempted to address all the issues related to the PD framework to calculate Expected Credit Loss-based provisions as per IFRS9.

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**IOT BASED WEATHER REPORTING SYSTEM-A REVIEW**

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**ABSTRACT**

*With a extreme change in climatic conditions continuously it is very disastrous to the people who are living in the disaster-prone areas. In some areas the people are not properly warned for the consequences of coming specifically in their areas, they are told about the average temperature and humidity of the city while the humidity and temperature vary at different altitude and changes at short distances. The main purpose of the paper is to design and develop a low-cost alternative weather monitoring system that will work in real-time with display of weather related parameters. This proposed system mainly based on Node MCU for processing and sending the data. This system can display data on LCD/ oled or on web application. This system uses traditionally wired connection for stable and reliable data transmission with low cost. The system is tested properly. On the basis of data collected by all the sensors; it will give proper and updated weather values on display.*

*Keywords: Nodemcu, oled, IOT, Blynk, data, sensors.*

**1. INTRODUCTION**

Climate plays an essential role in human life the unparalleled growth of industries and vehicular traffic have seriously affected the purity of clean air and environment . Satellite weather report system gives condition of present which does not give the exact condition of the particular place. Here we are introducing a smart weather reporting system using IOT(Internet Of Things). It will allow people to check weather conditions in any specific region or area without any need of weather forecasting agency. This system uses rain, temperature, humidity, pressure sensors providing live and real time reporting of weather parameters. Weather monitoring system usually detects and gathers various weather parameters which can be analyzed and used for forecasting of weather. IOT and cloud technologies are very essential for achieving the aim for this system. IOT connects devices to the Internet. Using this Internet the information from the IOT devices can easily be transferred to the cloud and then from the cloud to the end user. Weather Monitoring comes under practical implementation of the concept of IOT(Internet of Things), it involves sensing and recording various weather parameters and using them for sending notifications, alerts, adjusting appliances accordingly and also for long term analysis. The devices are used to collect, organize and display Information accordingly. IOT(internet of things) is going to transform the world by monitoring and controlling the phenomenon of environment by using sensors/devices which are able to capture, process and transmit weather parameters. Cloud is availability of computer system resources like data storage, computing power without direct active management of user. The data captured is transmitted to the cloud so that the data could be further displayed. Cloud is availability of computer system resources like data storage, computing power without direct active management of user. The data captured by sensors transmitted to the cloud so that the data could be further displayed. The system consist NodeMcu board which is a microcontroller board consisting of 17 GPIO pins, a USB connection and wifi module is present in it. WIFI module is used to convert the data collected from the sensors and then send it to the web server. So, we can monitor weather conditions of any location in the world. The system continuously transmits this data to the micro controller which now processes this data and keeps on transmitting it to the online web server over a wifi connection/ on display screen. We can use oled or LCD screen as per our requirement for displaying the weather parameters. Also system allows user to set alerts for particular instances. Existing system model is presented IOT based Weather monitoring and reporting system where you can collect, process, analyze, and present your measured data on web server/display.

**2. LITERATURE REVIEW**

IOT(Internet Of Things) became a great area of interests for big tech companies, Institutes and obviously users or customers also. Many IOT based concepts have gained so much attention like Smart wearable devices, smart home, smart city ,smart vehicles, smart systems etc. Almost every application based on Internet of things include devices like transducers ,sensors and actuators attached to the microcontroller with a wireless/wired flow of data to a remote cloud service or a local data storage which converts the raw data to a significant information which can further used in lots of areas. While working on this project we came across some works that have been accomplished in making smart applications using either Raspberry Pi boards or arduino board,oled,lcd and

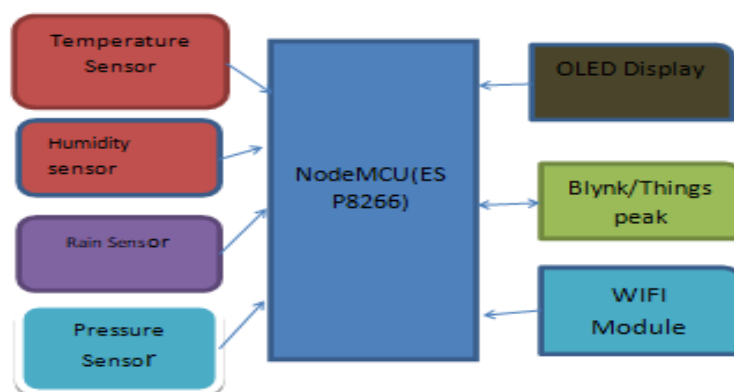


many more which are economical. There are lots of applications that are built using these boards for example smart city and other automation projects.

In [1], it was said that for a smart city "Places can be equipped with sensors and monitor environmental conditions, athletes or cyclist will be able to find the most prominent and say "healthy" trips and the city can respond by adjusting the traffic or by planting more trees in some areas. Citizens will be access this data to promote the creation of applications using real-time information for residents." So we can say that this weather monitoring system will be helpful in some smart city projects also. According to [2] the monitoring systems can provide self-protection to our environment such as protecting public health from the pollution or at least reducing the effects of pollution on the public. It will successfully notify us whenever the temperature is lower than it should be or is higher than normal. It can also automatically notify whether it is raining so one may carry an umbrella or a raincoat. In [3] the authors chose a single sensor i.e. Composite of DHT11 sensor for reading both temperature and humidity. Earlier people used to stay at home and so busy in their household works or people who work in offices had no idea about the environmental parameters/conditions outside their home or offices. People have no idea if the temperature outside is quite low or high or normal or if it is raining or not or the value of the humidity in the environment. In [4] weather monitoring system was composed using a particle photon which is an Arduino Compatible IOT board. It can also give us morning, evening and night wish messages as it consist a Light Sensor. In [5] have mentioned a great thing that "By placing sensor devices in the surrounding environment, we can bring the environment into real life." In [6] This model can be used for industrial & domestic for (weather monitoring or Humidity monitoring) etc. alert Message can be send to users, time to time.

In IOT enabled weather monitoring system project, NODEMCU(ESP8266) will measures four different weather parameters using four respective sensors. These sensors are temperature sensor, humidity sensor, pressure sensor and rain level sensor. These four sensors are directly connected to NODEMCU. NODEMCU consist inbuilt Analog to digital converter. NODEMCU calculates and displays these weather parameters on LCD or OLED display. Then it will send these different parameters to Internet with the help of IOT techniques. In general, we know the weather condition using TV resources which present that weather report whose offered by the space research centers, but it is the overall weather report of each and every country. If we wants to know the humidity, temperature, pressure etc. Parameters of a specific region or area this weather reporting system will help us. There are lots of systems available in the market but they are so costly and less precise. Sometimes these systems are not as per our requirement. This IoT based system works on sensor's working. Temperature and humidity sensor works on the principle voltage and current, means when temperature is increased then its producing voltage is increased while when humidity is increased then its producing current will increased.

### 3. SYSTEM DESIGN



This system is totally based on IOT and its sensors. We are using sensors for the purpose of sensing external weather parameters like temperature, humidity, pressure etc. Sensors will collect some useful data from the environment. This collected data then transferred towards NODEMCU which will collect, process, analyze, and present your measured data. Blynk or Thingspeak platform will help for coding and cloud storage of data. Wifi module will help us to connect wireless with different platforms like web and applications. Following are 4 tiers for implementation of this system:

**Tier 1:** Measuring Environmental Parameters like Temperature, humidity, pressure etc.

Tier 2: Using Sensors with different Ranges and purposes.

**Tier 3:** Acquisition of sensor data and Decision making.

**Tier 4:** In this , the collected and processed data will be stored in cloud and displayed on website or oled display.

Steps of implementaion are as follows:

**Step1:** connecting Sensors and Microcontroller .

**Step 2:** Processing of sensors data using Microcontroller and Embedded c/c++.

**Step 3:** Sending Monitoring parameters towards cloud using WIFI module.

**Step 4:** Developing the display and web app for displaying the parameters.

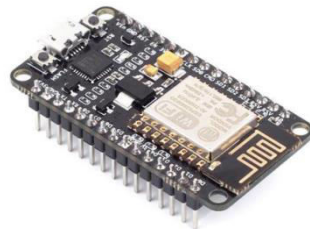
**Step 5:** Displaying the parameters on developed display and web application.

In brief Hardware as well as Software components we are using are as follows:

### 3.1 Hardware Components:

#### 3.1.1 NodeMCU

NodeMCU is based on ESP8266 which is able to connect objects and let data transfer using the Wi-Fi protocol. In addition, by providing some of the most essential features of microcontrollers such as GPIO, PWM, ADC, and etc, it can solve many of the project's needs alone itself.



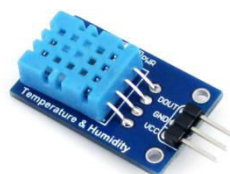
#### 3.1.2 Rain Sensor Unit

Rain sensor is mainly used to detect rainfall or water droplets. It works like switch. Normally the switch is open condition. This sensor consists of mainly two parts, one is Sensing Pad and another one is the Sensor Module. When rainfall or water drops fall on the Sensing Pad surface, then the switch will be off/closed. The Sensor part reads data from the sensor pad and processes it and converts it into a digital/analog output. So, the sensor can provide both types of output Analog and Digital output.



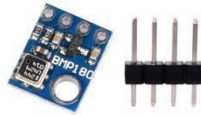
#### 3.1.3 DHT11 Sensor

The DHT11 is a ultra low-cost digital humidity and temperature sensor. It uses a capacitive humidity sensor and a thermistor to compute the surrounding air and spits out a digital signal on the data pin (no analog input pins needed).



### 3.1.4 BMP180 Sensor

The BMP180 measures both pressure as well as temperature, because temperature changes the density of gasses like air. At high temperatures, air is not so dense and heavy, so it gives less pressure on the sensor. At low temperatures, air is larger dense and weighs more, so it exerts huge pressure on the sensor.



### 3.1.5 OLED Display

An organic light-emitting diode (OLED or organic LED), also known as organic electroluminescent (organic EL) diode, is a light-emitting diode (LED) in which the emissive electroluminescent layer is a film of organic compound that emits light in response to an electric current. It is used as a display in many projects. It gives colorful display.



## 4. CONCLUSION

Here we come to know that how present system is better and also more efficient than the other systems present in markets. It is exceptionally compatible and reduces human efforts. This concludes that present project work is a huge success and will provide a considerable way for saving weather parameters of real time and will help industries, farmers, normal people as well as others whose daily life is related with weather and its parameters. It can be used to get required information about for particular area for many years. Farmers can use it for the modification in environment conditions as per plant's requirements. Hence productivity and crop will increase.

## 5. FUTURE SCOPE

This system will help in monitoring the weather conditions so that anyone can do their work Accordingly. If farmers want to grow a crop that grows in any particular weather conditions then this system is very useful. Farmer will set its conditions according to the crop. He just need to install this system only once and then he can check the parameters. Present model can be updated to monitor the cities and industries to gather pollution related data. This system can also be used for Smart City management projects which will be very useful for city's in future. We can do lots of additions in this system such as adding , gas sensor like CO, soil and moisture retrieving sensor which will able to tell us water content present in soil etc., Other sensors like soil moisture sensor, gas sensor, pressure measuring sensor can also be interfaced with existing system to get data about any particular place.

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**REVIEW ON FORMULATION METHODS AND EVALUATION TESTS OF LOZENGES DOSAGE FORM**

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**Dr. Aparark Moholkar, Niranjana Nadiwade, Anand Piske and Rutuja Byale**

**ABSTRACT**

*One of the most often utilized dosage form types is lozenges. The advantages of the medicinal lozenges are that they prolong the time the dosage form is retained in the oral cavity, increasing bioavailability while decreasing gastrointestinal irritability and avoiding first-pass metabolism. Lozenges offer a tasty way to administer dose forms and are popular on the pharmaceutical market due to their many benefits, but they also have some drawbacks. This dose form can be used for both local and systemic therapy, and a variety of active substances can be added. The current overview explains the uses of lozenges as well as nearly all of the aspects related to lozenges.*

*Keywords: Lozenges, troche mixture, Moulds.*

**INTRODUCTION**

Lozenges are flavor-enhanced pharmaceutical dosage forms that are meant to be sucked and kept in the mouth or pharynx. They typically contain one or more medications in the base that has been sweetened.

If the medication is well absorbed through the buccal linings or when it is ingested, lozenges are meant to ease oropharyngeal symptoms, which are frequently brought on by local infections.

Patients who are unable to swallow solid oral dosage forms or medications that need to be released gradually to maintain a steady level in the mouth or to saturate the throat tissues with the drug solution can utilise lozenges.

Analgesics, anaesthetics, antimicrobials, antiseptics, antitussives, aromatics, astringents, corticosteroids, decongestants, and demulcents are medications that are frequently included in lozenges. This is by no means a comprehensive list, though, as many different medications may be delivered by a lozenge. Additionally, depending on the demands of the individual patient, compounded lozenges made from one or more ingredients can be made.

**Advantages and disadvantages of medicated lozenges**

Lozenges provide formulation scientists with a number of benefits, including avoiding first-pass metabolism, increasing bioavailability for use in local and systemic effects through the buccal mucosa, better patient compliance for patients who have trouble swallowing, and ease of production and storage.

The lack of widespread drug distribution in saliva for local therapy and the potential for drug drainage from the oral cavity to the stomach are disadvantages of medicated lozenges.

**Classification of Lozenges**

Lozenges can be categorized into many classes using a variety of techniques, including

(A) According to the site of action

(a) Local effect Ex. Antiseptics, Decongestants.

(b) Systemic effect Ex. Vitamins, Nicotine.

(B) According to texture and composition-

(a) Chewy or caramel-based medicated lozenges

These are the dosage forms where the medication is mixed with a caramel foundation that must be chewed rather than dissolved in the tongue.

The glycerinated gelatine suppository formula, which consists of glycerine, gelatine, and water, provides the foundation for the majority of formulations.

These lozenges frequently taste strongly of fruit and may have a mildly acidic flavour to mask the bitter taste of the glycerine.

(b) Compressed tablet lozenges

If the active substance is heat-sensitive, compression may be used to prepare it. The process for granulation is the same as that used to make crushed tablets.

These tablets' slower dissolution profiles, non-disintegrating traits, and organoleptic qualities set them apart from standard tablets.

#### (c) Soft lozenges

Either chewing or gradual drug release in the mouth is intended for them. They can be produced using PEG 1000 or 1450, chocolate, or a basis of sugar and acacia, and certain soft candy formulations may additionally include acacia and silica gel. To prevent components from sinking to the bottom of the mould cavity during cooling, silica gel is utilised as a suspending agent, and acacia is used to add roughness and smoothness.

Only heat-resistant ingredients are appropriate for the formulation because it calls for a heating process at roughly 50°C.

#### (d) Hard Candy Lozenges

Hard candy lozenges are amorphous (non-crystalline) or glassy combinations of sugar and other carbohydrates. They can also be thought of as solid sugar syrups. The hard candy lozenge's weight and moisture content should be between 1.5 and 4.5 g and 0.5 to 1.5%, respectively.

These should slowly dissolve or erode over the course of 5 to 10 minutes; they shouldn't disintegrate. Heat-labile materials cannot be added to them because of the high temperatures needed for their preparation.

These pastilles were made using procedures of heating and congealing.

Disadvantage: Heat-labile materials cannot be prepared because of the high temperature needed for their preparation



### Lozenges

#### Types of lozenges

- (a) Chewable lozenges
- (b) Compressed lozenge
- (c) Soft lozenge
- (d) Hard lozenge

S.L.NO.	TYPE OF LOZENGES(CENTER)	CONSTITUENTS	PERCENT (%) WEIGHT
1	Liquid fill	Fruit juice, sugar syrup, hydroalcoholic solutions, or Sorbitol solution.	10-20
2	Fruit center	Jams and jellies whose viscosity has been modified with corn syrup or liquid sucrose	22-27
3	Paste center	Granules and crystals formulated as paste	38-40
4	Fat center	Medicament or flavours being suspended or dissolved in hydrogenated vegetable oil	27-30

### MATERIAL OF LOZENGES AND THEIR FUNCTIONS

S.L.NO.	INGREDIENTS	EXAMPLES	Role
1	<b>Candy base</b> a. Sugar b. Sugar-free vehicles c. Fillers	a. Dextrose, sucrose, maltose, lactose. b. Mannitol, sorbitol, polyethylene glycol (PEG) 600 and 800. c. Di calcium phosphate, calcium sulphate, calcium carbonate, lactose, microcrystalline cellulose	These are used to enhance flowability and as sweetening agents.
2	<b>Lubricants</b>	Magnesium stearate, calcium stearate, stearic acid and PEG, vegetable oils, and fats.	These are employed to prevent confectionery from sticking to teeth.

3	<b>Binders</b>	Acacia, corn syrup, sugar syrup, gelatine, polyvinylpyrrolidone, tragacanth and methylcellulose.	These serve as a container for the particles.
4	<b>Colouring agents</b>	Water soluble and lanoline dyes, FD & C colours, orange colour paste, red colour cubes, etc.	These are utilised to improve the dose form's organoleptic qualities and visual appeal.
5	<b>Flavouring agent</b>	Menthol, eucalyptus oil, spearmint, cherry flavour, etc.	These are used to give a taste.
6	<b>Whipping agent</b>	Milk protein, egg albumin, gelatine, xanthan gum, starch, pectin, algin, and carrageenan.	These are utilised in confections made with toffee.
7	<b>Humectants</b>	Glycerine, propylene glycol, and sorbitol.	They enhance the chew's mouthfeel qualities.

### 1. Sugar

Sugarcane or beets are used to produce sucrose, a disaccharide comprising glucose and fructose. The decision to use cane or beet sugar depends on geography and the availability of both.

Because of their importance as neutral sweeteners, easy solubility, and ability to act as a "drier" to lower the weight of the confection by crystallization, sucrose, and sucrose products are employed in medicinal lozenges.

### 2. Corn syrup

Almost all types of confections employ corn syrup to prevent sucrose and dextrose crystallisation, which can cause crumbling.

The development of an amorphous glass and the creation of candy with a pleasing look are both enabled by the use of corn syrup in the proper ratio with sucrose and dextrose.

When making medicated sweets, the physical characteristics of corn syrup such as density, dextrose equivalent, hygroscopicity, sugar crystallisation, viscosity, freezing point depression, and osmotic pressure are crucial.

### 3. Sugar bases

Sucrose or compressible sugar, dextrose, mannitol, and sorbitol are the sugar bases typically used in lozenge tablets. These substances are offered in particular tableting grades by a number of excipient producers.

They can be used in wet-granulation systems along with the binders mentioned above. They are typically designed for direct compaction applications.

A synthetic or natural sugar substitute with sweetness greater than or similar to sucrose is referred to as a non-nutritive sweetener.

These include xylitol, mannitol, sorbitol, invert sugar, etc. as examples of non-nutritive sweeteners.

### 4. Binders

Acacia, maize syrup, sugar syrup, gelatine, polyvinyl pyrrolidone, tragacanth, and methylcellulose are some of those typically utilised for a compressed tablet that is employed to hold the mass particles as distinct granules.

### 5. Lubricants

Magnesium stearate, calcium stearate, stearic acid, and PEG are some of these additives that are used to prevent candies from sticking to teeth and to enhance the flow of the final troche mixture.

### 6. Colorants

For appearance, product identification, and to cover up physical deterioration, colourants are added to medicinal lozenges.

Prior to selection, it is advisable to research a dye's and other organic colorant's compatibility with medications, excipients, and process conditions as they may degrade under heat or light via oxidation, hydrolysis, photo-oxidation, etc.

The current regulatory status of colourants can be found in great detail from colour suppliers.

### 7. Acidulants

To improve and fortify the flavour profile of medicinal lozenges, acidulants are typically included. The most widely utilised organic acids are citric, malic, fumaric, and tartaric acids.



The most popular is tartaric acid alone or in conjunction with citric acid. acids are also used in medicinal lozenges to change the pH in order to preserve the potency of the medication

### 8. Preservatives

Since these dose forms are solid, preservatives are typically unnecessary. However, because hard candy lozenges are hygroscopic, if they are not wrapped properly, the water content may rise and bacterial development may take place.

The resulting highly concentrated sucrose solution is bacteriostatic in nature and would not promote bacterial development since the water that is already there would dissolve some of the sucrose. It would be appropriate to make a few observations about the flavours and effects of preservatives.

### 9. Flavours

The flavours used in medicated lozenges must be both able to resist the rigours of manufacture as well as be compatible with the medicine and excipients.

Numerous compounds that are included in flavours can interact with excipients or medications and are oxidised by heat and light. Drugs and aldehydes, ketones, and esters may interact.

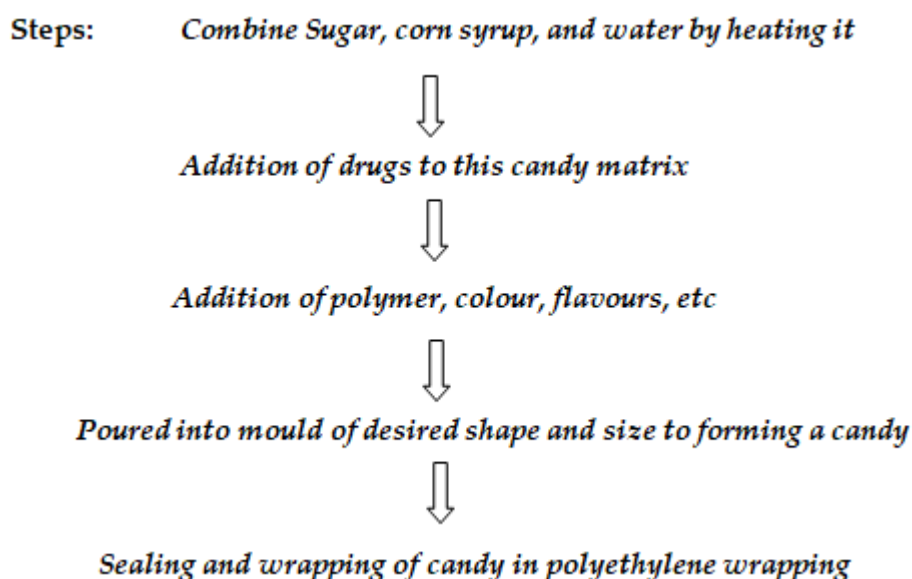
The interaction of a primary amine medication (benzocaine, phenylpropanolamine) and an aldehyde containing flavours such as cherry, banana, etc. causes a Schiff base to develop, which causes drug breakdown and loss of efficacy.

The pH of the lozenge base may be changed to enhance specific flavours, such as citrus, which may make some medications incompatible with it.

## MATERIALS AND METHODS

### Method of preparation of medicated Lozenges

The technique used → heating and congealing.



### Candy Based Lozenges

#### (a) Heating and Congealing Technique

The necessary amounts of sugar were dissolved in water in a beaker to create the syrupy foundation, which was then kept to heat on a hot plate.

The temperature was held between 105 and 110 °C until it thickened. After 30 minutes, the medication and other excipients (apart from plasticizer) were manually added, thoroughly mixed, and the heating procedure was continued.

After an additional 45 minutes of heating, plasticizer was added to the formed mass. The pre-cooled and pre-lubricated mould was then filled with the aforementioned syrupy base, and the mould was set aside for 10 to 15 minutes.

The lozenges were left for air drying after being taken out of the mould.

The step of adding plasticizer was skipped from the protocol for batches without plasticizers.

#### **(b) Melting and Mould Technique**

PEG was melted in the water bath and blended thoroughly with the other components.

The mixture was then poured into a stainless-steel mould that was the proper shape and size to create candy.

#### **Compressed Tablet lozenges**

##### **(a) Direct compression technique**

Ingredients can be properly combined and compacted straight away.

##### **(b) Wet granulation technique**

Before compression, flavour and lubricant are added after the sucrose has been mechanically combined into a fine powder.

The mass is then created by adding the binder solution and passing it through a #16 sieve.

#### **Evaluation of Medicated Lozenges**

By using industry-recognized pharmaceutical standards, the prepared lozenges were assessed for characteristics including drug content uniformity, hardness, thickness and diameter, weight variation, friability and in vitro dissolution test, drug content, moisture content analysis, and stability studies.

**Diameter:** Vernier callipers were used to calculate the diameter and thickness of the lozenges. Average values were computed using three lozenges from each batch.

The percentage by which the lozenges' diameter differed from the target value was  $\pm 5\%$ .

**Weight variation:** By measuring each of the 20 lozenges separately, determining the average weight, and comparing the individual lozenges' weights to the average value, the weight variance was measured.

$$\text{Weight Variation} = \frac{\text{Average Weight} - \text{Initial Weight}}{\text{Average Weight}}$$

**Hardness:** The power needed to break the lozenges was recorded when the hardness of the lozenges was assessed using a Monsanto Hardness tester. Hardness was expressed as (kg/cm<sup>2</sup>) units.

**Friability:** Roche Friabilator was used to assess the lozenges' friability.

The friabilator was filled with weighed lozenges and ran for 4 minutes at 25 rpm.

After that, the pills were cleaned of any dust and reweighed. Friability was calculated as a percentage.

**Moisture content analysis:** The Helium moisture balance equipment is used to calculate the amount of moisture in the finished confectionery.

One gramme of the material was weighed after being crushed in a mortar, and the moisture content was calculated using the moisture-balancing equipment.

**Mouth dissolving time test:** Hard-boiled candy lozenges were placed in each tube of the USP Disintegration apparatus, and the time it took for the lozenges to dissolve completely was recorded using a phosphate buffer of pH 6.8 at 37 degrees Celsius.

This method was used to determine how long it took the candy to dissolve completely.

**In-vitro drug dissolution studies:** The effectiveness of the tablet lozenge may be correlated with the rate of dissolution.

The dissolution investigation was conducted using the USP II paddle method at 150 rpm in 800 ml of phosphate buffer with a pH of 6.8. At 5-minute intervals, samples were removed and immediately reintroduced with an equivalent volume of fresh buffer for UV spectrophotometer analysis.

**Drug content:** The right quantity of lollipops is crushed, dissolved in the right solvent, and the solution's absorbance is measured spectrophotometrically.

**Stability studies:** The stability experiments were carried out to evaluate the drug's chemical and physical stability, which may have an impact on the organoleptic qualities of the lozenges.

Over the course of seven weeks, an accelerated stability study was carried out in accordance with ICH guidelines (zone IV) at 45°C and 75% relative humidity.

There were enough optimal formulas packaged in amber-colored screw-capped bottles and housed in an incubator with a 37°C temperature setting. Samples were collected at 15-day intervals to determine the drug content and assess the organoleptic qualities.

**Storage:**

These preparations should be kept out of children's reach and out of the heat. Extreme humidity should be kept away from them.

Either room temperature or chilled temperature is typically recommended, depending on the storage needs of the medicine and base.

**Packaging:**

Hard candies are hygroscopic and frequently susceptible to absorbing moisture from the air. The hygroscopic property of the candy base, the way the lozenges are stored, how long they are stored, and the possibility of drug interactions all need to be taken into account.

For the purpose of preventing drying, these goods should be kept in tight containers.

The chewable lozenges in particular may dry up excessively and become challenging to eat. If a disposable mould with a cardboard sleeve is utilised, it is recommended to place this unit inside a sealable plastic bag that has been appropriately labelled.

**DISCUSSION**

The technique of creating lozenges is quick and simple. It is a formulation that is more organoleptically well-tolerated, especially by patients who are young.

Pediatric patients will benefit from taking medication in the form of lozenges. Additional benefits for effective therapy include low dose, immediate onset of action, reduced dosage regimen, and economics.

They will also be more convenient and comfortable for the patient.

This will provide a more superior and creative dose form. Lozenges currently have a significant role in the pharmacy and will do so in the future.

**CONCLUSION**

Lozenges are medicinal candies that date back to the early 20th century and are still manufactured for sale.

The majority of the medications come in extremely affordable dose levels and are sold over the counter.

They are made for both systemic and local therapy.

They might include a variety of activities in their structure. Lozenges currently have a significant role in the pharmacy and will do so in the future.

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**FINANCIAL ACCOUNTABILITY IN THE MANAGEMENT OF VILLAGE FUNDS IN LALAFANG VILLAGE, PANTAR TIMUR DISTRICT, ALOR REGENCY , 2015-2020 BUDGET YEARS**

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**ABSTRACT**

*The management of Lalafang Village funds has not fully complied with the provisions, namely remaining cash for the management of the village income and expenditure budget. 2019 amounted to IDR 56,794,500 and a cash difference of IDR 2,657,000 that had not been deposited into the village treasury, Excavation Tax C Fiscal Year 2018 to 2020, IDR 53,753,550 has not been deposited into the regional treasury, cash disbursements for grant spending, social assistance spending and financial assistance. 2015 to 2020 amounting to IDR 586,016,052 is not supported by complete and valid evidence, From 2015 to 2020 the Lalafang Village Government through the village head does not make and submit village head reports at the end of each fiscal year to the Regent. Without accountability in good village fund management, it can lead to potential fraud committed by village officials as fund managers.*

*This study uses a qualitative research approach located in Lalafang Village, Pantar Timur District, Alor Regency with a research focus on village fund management mechanisms from 2015 to 2020 and sub focus on planning accountability, implementation accountability, administrative accountability and reporting accountability. Data collection was obtained by means of observation, interviews, and also documentation studies to collect data, data processing or data analysis, preparing reports, and drawing conclusions from the data obtained .*

*The results of the study found that; (1) Planning is carried out transparently by involving community participation in the village. Village fund planning begins with the village head as the person in charge of village funds conducting village meetings to discuss the village fund program plan which is attended by elements of the village government, the Village Consultative Body, and elements of the village community consisting of community leaders, traditional leaders, religious leaders, educational leaders, (2) Implementation is in accordance with the activities that have been determined in the Village Revenue and Expenditure Budget (APB Desa). However, there is a lack of responsibility from the TPK due to late reporting. Then the receipt and expenditure transactions are also carried out properly by the treasurer by completing complete and valid documents and evidence, (3) Administration is carried out with the village financial system application (SISKEUDes). For financing, it is recorded in the Details of Financing. However, the Village Treasurer experienced several obstacles in administration such as errors, incompleteness, and disorder related to documents or SPJ from the TPK or Kaur concerned and (4) Reporting and accountability for the realization of APBDesa implementation was submitted late to the Regency due to several obstacles encountered such as limited knowledge to accessing regulations related to the management of village funds, Lalafang's income which is slow to enter Lalafang's treasury, and delays in submitting proof of expenditure accountability (SPJ).*

*Keywords: Accountability, Village and Budget*

**1. INTRODUCTION**

Law number 23 of 2014 concerning Regional Government stipulates that a village is a village and customary village or what is referred to by another name, hereinafter referred to as a village, is a legal community unit that has territorial boundaries that are authorized to regulate and manage government affairs, the interests of the local community based on community initiatives, origin rights, and/or traditional rights that are recognized and respected in the government system of the Unitary State of the Republic of Indonesia.

In carrying out government affairs and serving the interests of the community, the village has the right to get a source of income. Village income can be sourced from (1) original village income consisting of business results, asset income, self-help and participation, mutual cooperation, and other original village income, (2) State Revenue and Expenditure Budget Allocation (3) Share of tax proceeds regional and regency/municipal retributions, (4) Village Fund Allocation which is part of the balancing fund received by regencies/municipalities, (5) Financial assistance from the Provincial APBD and Regency APBD, (6) Non-binding grants and donations from third parties and (7) other legitimate village income.

Village funds are APBN funds intended for villages which are transferred through the Regency/City APBD with equal and equitable allocations to each village which are prioritized to finance government activities, implementation of development, community development and community empowerment. According to Law

Number 6 of 2014, the objectives of village funds are as follows (1) to improve public services in the village, (2) to eradicate poverty, (3) to promote the village economy, (4) to overcome the development gap between villages, and (5) strengthening rural communities as subjects of development.

Village financial management is carried out on the basis of transparent, accountable, participatory principles and is carried out in an orderly and budgetary discipline. Accountability is the principle that determines that every activity and the final result of the implementation of Village Government activities must be accountable to the Village community in accordance with the provisions of the legislation.

In law Number 28 Year 1999 about maintenance Country which Clean and Free from Corruption, Collusion and Nepotism explains that what is meant by the principle of accountability is the principle that determines that every activity and result of state administration activities must could be accounted for to Public as holder sovereignty highest country in accordance with the provisions of the applicable laws and regulations. Accountability can also be interpreted as a guarantee of open liability to the parties affected by the implementation of the policy on every activity organized by the government (Krina 2003). Where according to Darise (2007) accountability is form accountability which Required conducted for individual management and control source power as well as doing policy in skeleton for each destination which has been established. The researcher concludes that accountability is an obligation in the form of: accountability for the performance of an organization that must be carried out by a person or group in management and control as well as policy implementation.

According to the State Administration Agency (LAN) there are three kinds of accountability: (1) Financial accountability, financial accountability is accountability regarding financial integrity, disclosure, and compliance with regulations, (2) Benefit accountability, benefit accountability basically pays attention to the results of activities government activities, (3) Procedural accountability, is the responsibility for whether a procedure for implementing a policy has considered issues of morality, ethics, legal certainty, and adherence to political decisions to support the achievement of the final goals that have been set.

According to Mahmudi (2010) quoting from Hopwood and Tomkins, 1984; Elwood, 1993. The dimensions of accountability that must be met by these public institutions include: (1) Legal Accountability and Honesty, (2) Managerial Accountability, (3) Accountability Program, (4) Policy Accountability, (5) Financial Accountability.

One of accountability which use in scope government including of them government village is financial/financial accountability. According to Mahmudi (2007) financial accountability is form accountability which conducted by institutions government in use public funds effectively, economically and efficiently, avoid leakage and waste of funds and corruption. Financial accountability emphasizes the financial amount and budget. Financial accountability is very important because it contains accountability in managing public finances so that it will be in the public spot light. Accountability This requires government agencies to make financial reports as a description of the organization's financial performance to external parties. From that statement, it is very important for the village government to carry out financial accountability as a form of accountability in managing the budget that has been set so that the public could know how government performance results the village actually.

Since the introduction of village funds starting in 2015, 158 villages in Alor Regency have also received village funds in the amount ranging from Rp. 200,000,000 to Rp. 1,500,000,000, which is very helpful in accelerating development in villages and improving community welfare. With village funds, the community must be able to participate as direct supervisors and the need for the role of the Regency Government as the funder to always monitor the progress of development. The village must also show financial accountability as a budget user in supporting the implementation of village autonomy, so that it can run well and be accountable to the central government.

Data on the findings of the Alor Regency Regional Inspectorate's examination of the management of village funds in 158 villages in Alor Regency from 2015 to 2020 found several problems related to financial accountability, namely (1) Accountability of village funds was not timely, (2) Accountability of village funds was not equipped with complete and valid evidence, (3) The remaining cash from village funds is not deposited into the village treasury at the end of the budget period, (4) there is evidence of fictitious accountability for village fund activities that are not implemented, (5) Taxes on the realization of village fund expenditures are not deposited into the state treasury and regional treasury, (6) The amount of expenditure accountability is not in accordance with the realization of the physical volume of work, and a team of experts is not formed to conduct



an examination/assessment of the volume and quality of the physical realization of village infrastructure at each stage of disbursement of funds and at the end of the work .

The phenomena mentioned above have resulted in the goal of developing village infrastructure not achieving the maximum output in accordance with the plan, the village community is disadvantaged because village funds are not fully realized to fulfill community needs as planned, as well as the occurrence of acts of misuse of village funds finance by village officials. village fund manager.

Lalafang Village is the village that receives the largest village funds out of 11 (eleven) villages in the East Pantar District of Alor Regency, as for details of village fund receipts can be seen in table 1.1. the following:

**Table 1.1.** Details of Village Funds in East Pantar District 2020

East Pantar District		
No	Village Name	TA Village Fund Ceiling. 2020 (Rp)
1.	Lalafang	1,275,609,000
2.	Kaera	1,272,037,000
3.	Lekom	1,267,843,000
4	Independent	1,242,985,000
5	Caleb	1,143,266,000
6	Bungabali	1,137,235,000
7	Rose	1,100,794,000
8	Stone	1,092,201,000
9	ombay	1,079,208,000
10	Null	886,947,000
11	stray	851,907,000
Amount		12,572,032,000

*Source:* DPMD of Alor Regency (data processed by researchers)

The amount of village fund receipts in Lalafang Village from 2015 to 2020 is IDR 5,317,738,806. the details of the budget ceiling can be seen in table 1.2. the following

**Table 1.2.** Details of Lalafang Village Fund 2015 to 2020

No	Fiscal year	Village Fund Amount
1	2015	Rp267,444,000
2	2016	Rp602,302,683
3	2017	Rp768.708.123
4	2018	Rp1,082,034,000
5	2019	Rp1.321.641.000
6	2020	Rp1.275.609.000
Amount	Rp5,317,738,806	

*Source:* Village Fund SP2D Document 2015-2020 (processed)

Utilization of this village fund is used to finance 2 (two) fields, namely:

**Table 1.3.** Utilization of village funds from 2015 to 2020

No	Financing	Type of activity
1	Development Implementation	<ul style="list-style-type: none"> <li>- Environmental road construction</li> <li>- Village axis road construction</li> <li>- Construction of drainage channels</li> <li>- Construction of a cliff retaining wall (TPT)</li> <li>- Village hall building construction</li> <li>- Construction of clean water facilities</li> </ul>
2	Empowerment	<ul style="list-style-type: none"> <li>- Capacity building training for Bumdes managers</li> <li>- BUMDes Capital Participation</li> </ul>

*Source:* Lalafang Village APB Documents 2015-2020 (processed)

The amount of village funds owned by Lalafang Village must be managed properly so that the purpose of providing village funds to each village can be achieved according to the mandate of the law. The reality from the results of the researcher's search is seen from the Report on the Results of the Inspectorate of the Regional

Inspectorate of Alor Regency on the End of Term of Office of the Lalafang Village Head Period 2015 to 2020 number: 06/ID/LHP/AMJ-DES/2021 dated March 30, 2021, obtained information that the management of village funds has not fully complied with the provisions, namely (1) the remaining cash for the management of the TA village income and expenditure budget. 2019 amounted to IDR 56,794,500 and a cash difference of IDR 2,657,000 that had not been deposited into the village treasury, (2) Excavation Tax C TA. 2018 to 2020, IDR 53,753,550 has not been deposited into the regional treasury, (3) cash disbursements for grant spending, social assistance spending and TA financial assistance. 2015 to 2020 amounting to IDR 586,016.052 is not supported by complete and valid evidence, (4) From 2015 to 2020 the Lalafang Village Government through the village head does not make and submit village head reports at the end of each fiscal year to the Regent through the Camat, to the Village Consultative Body (BPD) as well as to the village community as a form of accountability for the administration of village governance for 1 (one) fiscal year.

Without accountability in good village fund management, it can lead to potential fraud committed by village officials as fund managers.

Based on the above background, there is a conflict between reality and research results so that researchers want to know again the application of accountability in managing village funds. By conducting research related to Financial Accountability of Village Fund Management with the title "Financial Accountability in Village Fund Management in Lalafang Village, Pantar Timur District, Alor Regency, 2015 to 2020 Budget Years".

## **2. LITERATURE REVIEW**

### **A. Accountability Concept**

According to the State Administrative Institution (LAN) and the Financial and Development Supervisory Agency of the Republic of Indonesia (2000:12) Accountability is the obligation to provide accountability or answer and explain the performance of the actions of a person/leader of an organizational unit to those who have the right or the authority to ask for accountability. Accountability is important to ensure values such as efficiency, effectiveness, reliability and predictability. An accountability is not abstract but concrete and must be determined by law through a very specific set of procedures regarding what issues must be accounted for.

Romzek and Dubnick define accountability as a relationship in which individuals or institutions are obliged to account for their performance on the delegation of authority they receive to act, while the accountability mechanism is a tool to determine whether the delegated tasks are carried out in a satisfactory manner (Romzek and Dubnick). and Dubnick, 2000:382). According to this understanding, accountability is defined as answerability or the obligation to give accountability (Dubnick 2005:410-411; Bovens 2005). Bovens (2005) also notes that the person in charge or those who are accountable can be people, it can also be an institution, but it can also be seen as an "accountability forum" for example the general public. According to Bovens, accountability forums can be "virtual", for example awareness or personal truth values.

Understanding the concept of accountability put forward by Caiden (in Haryatmoko. 2011:107) as "fulfilling the responsibility to report, explain, give reasons, answer, carry out obligations, take into account and submit what was done and asked to be responsible or what the parties in the party want to know." outside the organization", especially by the public it serves.

Accountability is a term that is applied to measure whether public funds have been used appropriately for the purpose, where public funds were applied and not used illegally (Hatry, in Joko Widodo, 2001).

Candler and Plano (1982) in Joko Widodo (2001) define accountability as showing institutions about checks and balances in the administrative system. Accountability which means carrying out calculations of the resources or authorities used.

Nisjar (in Joko Widodo, 2001) defines accountability as an obligation for government officials to act as the guarantor for all actions and policies that they set.

Finner (in Joko Widodo, 2001) explains that accountability is a concept related to external standards that determine the correctness of an action by the state administration (public bureaucracy). This accountability judge is a person or institution that is outside of him. Therefore, this accountability is often referred to as objective responsibility. Objective responsibility stems from reasons for external control that encourage the apparatus to work hard so that the goals of the three Es (economy, efficiency, and effectiveness) of the organization can be achieved.

According to JB Ghartey (in Sedarmayanti, 2003), accountability is aimed at finding answers to questions related to what service, who, to whom, whose property, which and how. Questions that require answers include

what must be accounted for, why accountability must be handed over, who is responsible for various activities in the community, whether accountability goes hand in hand with adequate authority .

Accountability by Gay Peters (in Haryatmoko, 2011:109) is divided into three forms, namely (1) accountability is equated with transparency. The public official – the village head – must tell the public what he has done especially with regard to public needs. This openness has consequences for increasing public trust, if there are deviations that can be corrected, or causing apathy from the public for his leadership. (2) accountability is understood within the framework of responsibility, (3) accountability is understood as the ability to respond to public needs or or respond quickly to problems being faced by the public.

According to Halim (2014: 83), accountability is the obligation to provide accountability or answer and explain the performance of the actions of a person / legal entity or leader of an organization to parties who have the right and authority to ask for information or accountability.

Mardiasmo (2016: 46), accountability is an obligation to report and be responsible for the success or failure of the implementation of the organization's mission in achieving predetermined results through accountability media which is carried out regularly.

According to Wibisono (2018: 6), accountability is a term inherent in the study of governance (Governance). Accountability has several meanings whose terminology is often associated with several concepts such as answerability, responsibility, liability and other terminology related to the expectations of the mandate giver and the executor of the mandate.

Based on several theoretical studies according to experts, it can be concluded that Accountability is the obligation of a person or organizational unit to account for the success or failure of parties who have the right and authority to ask for information or accountability through the media of accountability periodically in order to ensure the achievement of values such as efficiency, effectiveness, reliability and predictability.

### **B. Accountability Type**

Administrative accountability has traditionally been in the form of a hierarchy through structural reporting. This model by the World Bank (1994, in LAN, 2000) is referred to as macro level accountability. This must be strengthened by a mechanism called micro accountability, which includes decentralization of rational decision-making, community participation and healthy competition in the business world.

Brautigam as quoted by Nisjar (1991) in Joko Widodo (2001) distinguishes between three types of accountability, namely:

1. Political accountability, related to the political system and electoral system. The multi-party political system is considered more capable of guaranteeing the government's political accountability to its people than the one-party system of government.
2. Financial accountability means that government officials are obliged to account for every rupiah of people's money in their budget, which is sourced from tax and levy revenues.
3. Legal accountability means that the people must have confidence that government units can be legally responsible for all their actions. Government organizations which in practice have harmed the interests of the people must be able to account for and accept legal claims for these actions.

Candler and Plano (1982) in Joko Widodo (2001) distinguish between 5 types of accountability, namely:

1. Fiscal accountability is the responsibility for the public funds used.
2. Legal accountability, is the responsibility for compliance with laws and regulations.
3. Program accountability is the responsibility for program implementation.
4. Process accountability is the responsibility for the implementation of procedures.
5. Outcome accountability is responsibility for the results of the implementation of tasks.

Yango (in LAN, 2000) distinguishes accountability into four types, namely:

1. Traditional or regularity accountability focuses on regular transactions or fiscal transactions to obtain information regarding compliance with applicable regulations, especially those related to fiscal regulations and administrative implementing regulations. This accountability is often also called compliance accountability.

2. Managerial accountability, emphasizing on the efficiency and economical use of funds, assets, human resources, and other sources.
3. Accountability program, which focuses on achieving the results of government operations.
4. Process accountability, focusing on information regarding the level of achievement of social welfare on the implementation of policies and organizational activities.

The State Administration Agency (LAN, 2000) also distinguishes three types of accountability, namely:

1. Financial accountability is responsibility regarding financial integrity, disclosure and compliance with laws and regulations.
2. Benefit accountability, basically pays attention to the results of government activities.
3. Procedural accountability, namely accountability regarding whether the procedures for determining and implementing a policy have taken into account moral, ethical, legal certainty, and adherence to political decisions to support the achievement of the final goals that have been set.

Carino (1993), in Joko Widodo (2001) distinguishes accountability into 4 types, namely:

1. Traditional accountability focuses on managing fiscal transactions and ensuring compliance with legal requirements and administrative policies. McKinney in Carino (1993, in Joko Widodo, 2001) defines traditional accountability as a responsibility of bureaucrats who have been given the authority to carry out certain functions as stated at the legal responsibility hierarchy level.
2. Managerial accountability, focuses on the input side and advocates the need for continuous special attention to avoid waste and unnecessary expenses and encourage the proper use of public resources. The main value of managerial accountability is efficiency and economy and includes a comparison between costs and results. Tantuico in Carino (1993) in Joko Widodo (2001) suggests managerial accountability is related to the efficient and economical use of public funds, property, labor, and other resources. Managerial accountability drives the program by cutting down convoluted procedures or work simplifications and revising all the ways towards improvement and reorganization of the agency/organization.
3. Program accountability, concerned with the results of government operations. Thus, program accountability relates to the ownership ( property ) of individual bureaucratic units that carry out joint activities to achieve program effectiveness. Although an external agency such as a legislature can carry out investigations into defined programs, the main focus of program accountability is the head of the agency or the manager of the program. Several points of investigation are very helpful for administrators to achieve program accountability and as a management tool in compiling, using and analyzing job productivity measures, program evaluation, and cost benefit analysis.
4. Process accountability, emphasizes more on the methods and operations of a system that transforms inputs into outputs. This type of accountability asserts that some goals may not be measured and replaced directly, but presents how activities are directed towards achieving goals

If one examines the several types of accountability stated above by several experts, the following types of accountability can be identified:

1. Traditional Accountability
2. Fiscal /Financial Accountability
3. Managerial Accountability
4. Legal accountability
5. Program accountability
6. Accountability of outcomes
7. Benefit accountability
8. Process accountability
9. Professional Accountability
10. Political accountability

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## 11. Moral accountability

### C. Financial Accountability

Mahmudi (2011) defines public accountability as an obligation of the trustee ( agent ) to provide accountability, present, report, and disclose all activities and activities that are his responsibility to the principal who has the right and authority to ask for such accountability. The giver of the trust has the right to supervise and control the course of management carried out by the authorized apparatus as an agent so that the expected goals are immediately achieved and also overcome unexpected events such as fraud in the allocation of village funds.

Rahmawati (2015), financial accountability is the responsibility of public institutions to use public funds economically, efficiently and effectively, there is no waste and leakage of funds and corruption. The village government must be able to explain how the money was obtained, where the money was spent and various other responsibilities. Financial accountability is very important because community financial management will be the main concern of the village community.

Accountability used in public financial management is financial accountability. Financial accountability is the responsibility of public institutions to use public funds ( public money ) economically, efficiently and effectively, there is no wastage and leakage of funds, as well as corruption and collusion. The results of good financial accountability will be used to make decisions related to the mobilization and allocation of resources and evaluate the efficiency of the use of funds. These results can be used by the general public and stakeholders to assess government performance based on certain previously agreed targets. Financial accountability is very important because it becomes the main focus of society. This accountability requires public institutions to make financial reports to describe the financial performance of the organization to outsiders. (Mardiasmo, 2002: 12)

Rahmawati (2015), Regarding the task of upholding financial accountability, the village government is responsible for publishing financial reports to its stakeholders. There are two reasons why it is necessary to publish financial statements:

- 1) From the internal side, financial reports are a means of controlling and evaluating performance for the government as a whole and for the work units within it. Financial reports are internal accountability , namely the responsibility of the head of the work unit to his superiors.
- 2) From the external side, government financial reports are a form of external accountability , namely accountability to the public, investors, donors, the press, and other interested parties.

Financial accountability will improve if it is supported by an accounting system that produces reliable, accurate, timely and accountable information. The results of good financial accountability will be used to make decisions related to the mobilization and allocation of resources and evaluate the efficiency of the use of village funds. These results can be used by the community and stakeholders to assess the performance of the village government based on certain previously agreed targets.

### 3. METHOD

The type of research used in this research is a case study. In selecting informants, researchers are expected to be able to see the abilities of the informants, so that the research objectives to be achieved can be answered. Informants in this study will be selected purposively , namely the determination of informants based on certain considerations, namely knowing enough about the local government's innovation program in education affairs and will be selected using the snow-ball technique . In analyzing the data, the author uses the Miles and Huberman analysis model. This analysis model is proposed by Miles and Huberman (1992) that qualitative data analysis is carried out interactively and takes place continuously until complete, so that the data becomes saturated. Activities in data analysis, namely data reduction ( data reduction ), data display ( data display ) and verification/conclusion ( Verification/conclusion drawing ).

## 4. RESULTS AND DISCUSSION

### A. Financial Accountability of Village Fund Management with the title “Financial Accountability in the Management of Village Funds in Lalafang Village, Pantar Timur District, Alor Regency , 2015 to 2020 Budget Year

In Permendagri No. 113 of 2014 concerning Village Financial Management, it is stated that the stages of village government financial management include planning, budgeting, implementation, administration, reporting and accountability stages.

In detail the stages of village financial management will be described as follows :

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**1. Planning**

Planning is the main foundation and becomes one of the management functions that play an important role in ensuring the achievement of the desired goals. In preparing a good plan, accurate data and information are needed from research and field evidence. FX Soedjadi in Syafiie et al (1999) provides a definition of planning as a process of thinking, guessing, and determining priorities that must be carried out rationally before carrying out actual actions in order to achieve goals.that has been set.

The planning stage is carried out transparently by involving the participation of the community in the village. Village fund planning begins with the village head as the person in charge of village funds conducting village meetings to discuss the village fund program plan which is attended by elements of the village government, the Village Consultative Body, and elements of the village community consisting of community leaders, traditional leaders, religious leaders, educational leaders. The results of the deliberation are then poured into the Village Government Work Plan (R K PD) as a reference in the preparation of the Village Budget. In this planning stage, village communities can access and participate in the decision-making process for planning the use of funds.

Village Funds are APBN funds intended for Villages which are transferred through the Regency/City APBD and are prioritized for the implementation of development and empowerment of rural communities (Kemenkeu, 2017). Therefore, the planning program and its activities are prepared through the Village Development Planning Deliberation forum (Musrenbangdes). Musrenbangdes is a deliberation forum that discusses proposals for village development activity plans guided by the principles of Village Community Participation Development Planning (P3MD). The principle of participation is the involvement of citizens in decision-making either directly or through institutions that represent their interests (Tjokroamidjojo, 2000).

In planning activities whose funds are sourced from village funds, one must really pay attention to the needs of the community, because village funds are the main source of income for villages in Alor Regency, including Lalafang Village. Therefore, the plan for the use of village funds is also the main material for the preparation of the APBDes which is discussed at the village level and agreed upon by the village government and the BPD as representatives of the village community as a guide for development, community, and service activities to village communities for one year .

The Village Government shall prepare a village development plan in accordance with its authority with reference to the Regency/City development planning. The Village Development Planning includes the Village RPJM and Village RKP which are prepared on a time basis and stipulated by Village Regulations. The Village Medium-Term Development Plan (RPJM Desa) is for a period of 6 (six) years while the Annual Village Development Plan or the so-called Village Government Work Plan (RKP Desa) is for a period of 1 (one) year. RKP Desa is an elaboration of the Village Medium-Term Development Plan. Village development planning is prepared based on the results of the agreement in village meetings, the implementation of which is no later than June of the current budget year .

Accuracy of planning is important in the village and should be in accordance with the problems being faced by a village because if there is no proper planning regarding the entire series of development activities carried out, it will affect the success or failure of development in the village. A well-planned and controlled village development is necessary so that the village development process is successful and selects an effective output.

**2. Implementation**

To support the disclosure and delivery of information to the public, every implementation of the Village Fund's physical activities must be equipped with an activity information board installed at the activity location. The information board contains the name of the activity, the volume of the activity, the amount of the budget, and the time of implementation. Then also provide information at the Village Office so that it is easily accessed by the community. Information disclosure is an attempt by the village government to implement the principle of transparency in the management of the Village Fund.

At this stage of implementation, an audit has been carried out with regard to the final audit of the Village Head's term of office conducted by the Regional Inspectorate of Alor Regency with the purpose of the audit to find out/assess the implementation of village government administration in terms of implementing general government administration and affairs based on the rights of origin of the village whether it has been implemented effectively , efficient, economical and obedient to laws and regulations with the findings of the examination results from the Inspectorate Report of the Alor Regency for the End of Term of Office of the Lalafang Village Head for the 2015 to 2020 period number: 06/ID/LHP/AMJ-DES/2021 dated March 30, 2021, several problems were found:

1. There is cash remaining for the management of the TA village income and expenditure budget. 2019 amounted to IDR 56,794,500 and a cash difference of IDR 2,657,000 which had not been deposited into the village treasury due to the negligence of the village treasurer who did not immediately deposit the remaining funds into the village treasury account at the end of the budget period in accordance with Law number 6 of 2014 concerning Village Funds article 51 letters (a), (b) and (c) ; Government Regulation Number 43 of 2014 concerning Implementing Regulations of Law Number 6 of 2014 Article 94; Minister of Home Affairs Regulation number 21 of 2018 concerning Village financial management article 2 paragraph (1) and article 31 resulted in the potential for abuse of village finances and financial losses of village funds amounting to Rp2,567,000
2. Excavation Tax C TA. 2018 to 2020 Rp53,753,550 has not been deposited into the regional treasury due to the negligence of the village treasurer who did not immediately deposit the Excavation C tax to the regional treasury in accordance with Minister of Home Affairs Regulation Number 21 of 2018 concerning Village Fund Management Article 2 paragraph (1) and Article 31; Alor Regent Decree No. 103/HK/KEP/2018 dated April 3, 2018 regarding the determination of the standard price for mineral extraction resulted in delays in regional revenues of Rp. 53,753,550
3. There are cash disbursements for grant spending, social assistance spending and TA financial assistance. 2015 to 2020 amounting to IDR 586,016,052 is not supported by complete and valid evidence because of the **weak** control that should be carried out by the Village Head and Responsible Budget and village treasurer for any evidence of accountability for grant spending, social assistance and financial assistance in **accordance** with the Minister of Home Affairs Regulation State Government Number 21 of 2018 concerning Village Financial Management Article 2 paragraph (1), article 24 paragraph (1) and (2) **resulted in** the accountability report submitted not describing the actual conditions and the potential for financial abuse to occur.
4. There was a loss in the management of the BUMDes Fund "Bunga Kemiri" in Lalafang Village for the investment of business capital of Rp. 20,000,000, due to the negligence of the Village Head as an advisor who did not carry out the function of controlling the implementation of Bumdes management activities properly and the negligence of the Bunga Kemiri Bumdes Management who did not monitor price conditions selling candlenut in Kalabahi periodically before making purchases in the village in accordance with the Regulation of the Minister of Villages, Development of Disadvantaged Regions and Transmigration Number 4 of 2015 concerning the Establishment, Management, Management and Dissolution of Village-Owned Enterprises Article 5 paragraph (1), (2), ( 3) , Article 27 paragraphs (1), (2), (3) and Article 31 resulted in the purpose of establishing Bumdes to increase community income and increase village original income was not achieved
5. The Village Head has not made and submitted a village head report for the 2017 to 2020 fiscal year, due to the negligence of the Village Apparatus in this case the Village Head, Village Secretary and Village Treasurer who have not understood and guided the provisions regarding village head reporting on village administration in accordance with the Act. Number 6 of 2014 concerning Villages Article 27 letter (a), Government Regulation Number 43 of 2014 concerning Technical Guidelines for the Implementation of Law Number 6 of 2014 concerning Villages Article 48 letter (a), Article 49 paragraphs (1), (2) and (3), Minister of Home Affairs Regulation Number 46 of 2016 concerning Village Head Reports Article 3 paragraphs (1), (2) and (11); Article 4 paragraph (1), article 8 paragraph (1), article 9 paragraph (1), article 10 paragraph (1), (2), (3) and (4) result in the result that the results cannot be known with certainty on the implementation of village government which will be used as evaluation material for planning for the next fiscal year
6. The administration of village administration is not in an orderly manner, due to the negligence of the village head and village secretary who do not administer village administration properly in accordance with applicable provisions in accordance with Law number 6 of 2014 concerning Villages Article 26 paragraph (4) letter (h); Government Regulation Number 43 of 2014 concerning Technical Guidelines for the Implementation of Law Number 6 of 2014 concerning Villages Article 62 paragraph (1), Minister of Home Affairs Regulation Number 47 of 2016 concerning Village Government Administration Article 3 paragraph (1), (2), ( 3) Article 4 paragraphs (1) and (2) result in the non-realization of a village administration capable of functioning as a source of data and information in the administration of village governance, implementation of development, community development and community empowerment.



7. Management of Village Assets/Inventory has not been implemented adequately due to negligence of the Village Head who has not appointed one of the Kaur to carry out the function of administering village assets/inventory and make a report on village assets at the end of each fiscal year in accordance with Government Regulation Number 43 of 2014 concerning Technical Guidelines for Law Implementation - Law Number 6 of 2014 concerning Villages Article 108, Regulation of the Minister of Home Affairs Number 113 of 2014 concerning Village Financial Management Article 38 paragraph (4); Regulation of the Minister of Home Affairs Number 1 of 2016 concerning Management of Village Assets Article 1 paragraph (5), (6), Article 3, Article 4 paragraph (1), (2), (4), (5), (6), Article 19 paragraphs (1) and (2) make it impossible to know the type and amount of wealth belonging to the village as well as government programs that enter the village in the year concerned and have the potential to lose village assets/inventory .

Based on observations, interviews and a review of the Lalafang Village document, it was concluded that in terms of applying the principle of accountability for the implementation of the Village Fund, it should actually be based on Permendagri Number 20 of 2018 concerning Village Financial Management which regulates the implementation in article 24 paragraphs 1 and 3 which says that all revenues and expenditures Villages in the context of implementation are carried out through the village treasury account and all receipts and expenditures must be supported by complete and valid evidence.

Implementation is prioritized in the field of development and empowerment. Implementation of Development Activities in Lalafang Village is carried out by the Head of the Development Section. The Village Government tries to implement the principle of transparency by installing information boards at the activity locations and at the village office. The implementation of the principle of accountability is carried out by reporting each stage of activity with reference to existing regulations. However, there are several main factors causing the various cases previously stated, namely the lack of understanding of the manager (TPK), the manager's understanding but intentionally allowing or not doing what should be done, the low / absence of supervision carried out hierarchically or externally through public opinion / pressure. , lack of knowledge due to lack of training for village officials.

### **3. Administration**

Administration is carried out by the Village Treasurer and is required to record every receipt and expenditure as well as close the books at the end of each month in an orderly manner, and account for money through an accountability report (Permendagri Number 113 of 2014 concerning Village Financial Management Article 35 paragraphs 1 and 2). The administration carried out by the Village Treasurer is: administration of village revenues, administration of village expenditures, administration of village financing. Administration is carried out using the General Cash Book, Tax Subsidiary Cash Book, and Bank Book.

Specifically for income and financing, there are supporting books in the form of a Book of Income Details and a Book of Details of Financing.

#### **a. Village Revenue Administration**

Revenue according to the Regulation of the Minister of Home Affairs Number 113 of 2014 concerning Village Financial Management article 9 is all money received through village accounts which are village rights in one fiscal year that do not need to be paid back by the village. The Village Treasurer records receipt transactions using the SISKEUDes application. Receipts come from third parties or from the central government which are directly deposited into the village treasury.

The recording of village financial receipts includes cash transactions and non-cash transactions. Lalafang Village records cash transactions with receipts, then they are recorded in the General Cash Book and also recorded in the Income/Receipt Details. For non-cash transactions, there is a transfer to the Lalafang Village Cash Account, then it is recorded in the Bank Book and Income Details Book.

#### **b. Village Shopping Administration**

Village Expenditures according to Permendagri No. 113 of 2014 concerning Village Financial Management article 12 is all expenditures from village accounts which are village obligations in one fiscal year which will not be repaid by the Village. Administration of Village Expenditures in Lalafang Village, namely the existence of withdrawals from the Lalafang Village treasury or Lalafang Village account in accordance with valid receipts and proof of expenditure then recorded in the General Cash Book or Bank Book and Tax Assistant Book.

The Village Treasurer records shopping transactions, both cash and non-cash, must be accompanied by complete and valid evidence and recorded correctly and in an orderly manner. Cash transactions are recorded with a shopping receipt then entered into the General Cash Book and if there is tax, it is also entered in the Tax

Subsidiary Book. Non-cash transactions through third parties are transferred to the TPK from Lalafang's account, then recorded in the Bank's Help Book.

c. Village Financing Administration according to Permendagri No. 113 of 2014 concerning Village Financial Management article 18 includes all receipts that need to be repaid and expenses that will be received back, both in the current fiscal year and in the following fiscal year. The administration of village financing, both receipt and expenditure transactions, is recorded in the Financing Details Book which is carried out correctly and in an orderly manner. Villages record financing transactions to the Bank Book and Financing Details Book.

d. The Village Treasurer's report is in accordance with article 35 of the Minister of Home Affairs No. 113 of 2014 the Village Treasurer is obliged to account for money through an accountability report submitted to the Village Head no later than the 10th of the following month. The Village Treasurer makes an accountability report every month by closing the book and recording all income and expenses then reporting it to the Lalafang Village Head. The Village Treasurer also applies the principle of accountability in administration by recording all income and expenditure transactions in accordance with complete and valid evidence.

Based on initial observations, interviews and documentation, it was concluded that the administration was carried out with the application of the village financial system (SISKEUDes). Recording of village receipts is carried out by the Village Treasurer with a receipt and when the funds enter the Lalafang Village account which is recorded in the General Cash Book, Bank Book, and Income Details Book. Meanwhile, the recording of the expenditure is a withdrawal from the Lalafang Village treasury and in accordance with valid evidence and receipts then recorded in the General Cash Book, Bank Book, and Tax Assistant Book. For financing, it is recorded in the Details of Financing. The Village Treasurer reports his accountability report every month to the Lalafang Village Head no later than the 10 (ten) of the following month. The Village Treasurer should also apply the principle of accountability by recording all receipts and expenditures transactions in accordance with valid and complete evidence.

The Village Treasurer experienced several obstacles in administration, such as errors, incomplete proof of expenditure receipts, and disorder related to documents or SPJ from the TPK or Kaur who managed development activity funds and aid spending.

#### **4. Reporting and Accountability**

##### **a. ABDesa Implementation Realization Report**

The Village Budget Implementation Realization Report is submitted to the Regent through the Camat consisting of a First Semester Report submitted no later than the end of July. Year-end semester report, submitted no later than the end of January of the following year (Permendagri No. 113 of 2014 article 37). Lalafang Village in submitting the Village Budget Implementation Realization Report experienced a semi-annual reporting delay, the main reason being related to the delay in reports from the TPK who carried out development activities because the activities experienced delays in completion as a result of the topographical conditions of the area which were difficult to access by vehicles transporting materials during the rainy season. Lack of knowledge and understanding and commitment from the TPK who is responsible for managing activities causes activity reports to be often late and sometimes the weather also causes activity reports to be slow.

Based on initial observations, interviews, and documents from Lalafang Village, it was concluded that reporting on the Realization of APBDesa Implementation was delayed. Reports are submitted through village meetings. At this reporting stage, there were several obstacles faced, such as the frequent changes to the Permendagri and Permendes, then from the work tools of Lalafang or Kaur Villages in completing the SPJ. The reason for the delay was also the late report from the TPK. Then for the implementation of accountability, there is also openness to the general public.

##### **b. Activity Implementation Report**

Reports on the implementation of activities are submitted to the Regent/Mayor through the Camat at the end of each year. As stated in Permendagri No. 113 of 2014 article 41 Activity Implementation Report submitted no later than one month after the fiscal year. Lalafang Village in submitting the Activity Implementation Report experienced delays, this was due to delays in the physical realization of village development expenditures, as well as other obstacles.

The implementation of the Village Fund is still required to be accountable for every expenditure of Village Fund money. Thus, if this is done continuously, in an orderly manner and in accordance with existing provisions, it can alleviate/support the preparation of the final accountability for village fund activities that must be prepared by the Village Implementing Team. However, administratively there are still things that have not

been carried out in accordance with the existing provisions so there is still a great need for assistance from the sub-district apparatus in order to lead to an orderly administration.

The results of the interview implied that the level of competence of village government officials still needed to be improved. These competencies are a combination of knowledge, skills, and attitudes that must always be strived for continuous improvement.

The Village Fund is one of the main sources of village income which is quite large and must be transparently accountable to the community and to the government at a higher level as the institution that gives authority. The Activity Implementation Report is submitted by holding a discussion in Lalafang Village with the BPD which is attended by the community. Reports are read out one by one starting from planning, use, to the percentage of realization.

Accountability carried out by the village government can be accountable to all levels of society openly. In this case, the village government of Lalafang implements it openly to the general public and is explained in front of higher parties and the community in the Lalafang Village deliberation. Openness by providing information to the public in writing with easily accessible information media such as bulletin boards, banners, and other media. In Lalafang Village, they use the same media, namely information boards, banners and billboards.

Based on initial observations, interviews, and village documents in Lalafang Village, it was concluded that the accountability report on the realization of the APBDesa implementation and the report on the implementation of activities were submitted late to the district. The accountability report is submitted by holding accountability deliberations with the BPD and the community. Accountability is also carried out with openness to the public. Transparency and participation is carried out by involving the community in accountability reporting and providing information to the public using media such as billboards and banners. However, in the accountability report there are still several obstacles faced such as regulations that often change, Lalafang's income is slow to enter Lalafang's treasury, and the problem of delays in submitting a Letter of Accountability for spending (SPJ).

## **5. CONCLUSION**

Based on the description of the explanations of the previous chapters, conclusions can be drawn relating to the Implementation of Financial Accountability for Village Fund Management in Lalafang Village, Pantar Timur District, Alor Regency, as follows:

- a) Planning is carried out transparently by involving community participation in the village. Village fund planning begins with the village head as the person in charge of village funds conducting village meetings to discuss the village fund program plan which is attended by elements of the village government, the Village Consultative Body, and elements of the village community consisting of community leaders, traditional leaders, religious leaders, educational leaders.
- b) Implementation is in accordance with the activities set out in the Village Revenue and Expenditure Budget (APB Desa) which is prioritized in the field of village infrastructure development, while community empowerment has not yet received a significant budget allocation. The Village Government tries to implement the principle of transparency by installing information boards at the activity locations and at the village office. The implementation of the principle of accountability is carried out by reporting each stage of activity with reference to existing regulations. However, there is a lack of responsibility from the TPK due to late reporting. Then the receipt and expenditure transactions are also carried out properly by the treasurer by completing complete and valid documents and evidence.
- c) Administration is carried out with the village financial system application (SISKEUDes). The treasurer records receipts when the funds enter the Lalafang Village account which is recorded in the General Cash Book, Bank Book, and Income Details Book. Meanwhile, the recording of the expenditure is a withdrawal from the Lalafang Village treasury and in accordance with valid evidence and receipts then recorded in the General Cash Book, Bank Book, and Tax Assistant Book. For financing, it is recorded in the Details of Financing. However, the Village Treasurer experienced several obstacles in administration such as errors, incompleteness, and disorder related to documents or SPJ from the TPK or Kaur concerned.
- d) Reports and accountability for the realization of APBDesa implementation were submitted late to the District due to several obstacles, such as limited knowledge to access regulations related to village fund management, Lalafang's income which was slow to enter Lalafang's treasury, and delays in submitting proof of expenditure accountability (SPJ).

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## MANAGEMENT OF PERFORMANCE TARGETS OF HEAD OF PERFORMANCE AT THE DEPARTMENT OF EDUCATION AND CULTURE OF MALACCA REGENCY

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### ABSTRACT

*Some of the problems that occur are related to employee performance targets by the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency. This condition can be detected when there are still frequent errors in the execution of work, such as incoming letters or reports to be addressed in the field that should be addressed, but the wrong address still occurs and if there are documents that need to be known by the leadership, but have not been submitted. In addition, errors have also been found in archiving files. Work that should have been completed at the time specified has not been achieved, for example in making Employee Performance Targets (SKP) which have not been completed past the specified time limit. Whereas SKP is the determination of performance targets.*

*The method used in this study is a qualitative research method, with a case study approach with 29 informants with the types of qualitative data and quantitative data while the data sources in this study came from primary data sources and secondary data while the data collection method in this study was research. Field Research ( Field Research ), Library ( Library Research ) while the Data Collection Techniques in this study were Observation, Qualitative Interviews and Qualitative Documents. Furthermore, the data obtained by researchers used the data analysis technique proposed by Bungin (2012:70), namely; Data Collection ( Data Collection ), Data Reduction ( Data Reduction ), Data Display and Verification and Confirmation of Conclusions ( Conclusion Drawing and Verification ).*

*The results of the study based on the opinion of Armstrong (1998:16-17) it is known that there are several factors that influence the performance target management of the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency with the findings, namely; (a) individual factors ( personal factors ) related to expertise, motivation, performance commitment of the Head of Sub-Division of Personnel of the Education and Culture Office of Malacca Regency which are still lacking, (b) leadership factors ( leadership factors ) that have not been effective, (c) group factors /coworkers ( team factors ) with minimal support quality, (d) system factors ( system factors ) related to systems/work methods without SOPs and non-existent building facilities (e) situational factors ( contextual/situational factors ), namely the environment internal, namely the quality and quantity of human resources, poor work ethic and work discipline that is still lacking and external in the form of changes in leadership and leadership styles.*

*The inhibiting factors for the management of the performance target of the Head of the Sub-Division of Personnel at the Education and Culture Office of Malacca Regency are; the political will of the regional head, minimal budget, the absence of permanent buildings and the quality of human resources.*

*Management, Goals, Performance and Employees*

### 1. PRELIMINARY

Achieving effective performance is a major concern of public sector reform. Therefore, it is necessary to implement an appropriate and clear performance system so that government administration takes place efficiently and effectively and responsibly. The government as a public sector organization that is responsible for carrying out its duties and functions, has a predetermined performance target. Because for Mangkunegara (2010:9) employee performance is the achievement of results in quality and quantity of an employee in carrying out his duties.

One of the efforts that can be done to find out the differences in the level of ability, skill, and knowledge of each employee is to conduct an assessment of all behaviors and activities in carrying out daily tasks and obligations so that Government Regulation Number 46 of 2011 concerning Work Performance Assessment is issued. PNS dated December 1, 2011 which is a refinement of PP No. 10 of 1979 concerning the Assessment of the Work Implementation of Civil Servants which is considered no longer in accordance with the development of circumstances and needs in the development of PNS and PP which took effect in early January 2014.

The definition of employee performance targets, hereinafter abbreviated as SKP according to Government Regulation Number 46 of 2011 concerning the Assessment of Civil Servants' Work Performance, are: "work plans and targets to be achieved by a civil servant." The work performance assessment of civil servants is carried out based on the principles of objective, measurable, accountable, participatory and transparent. The



elements that are assessed as work performance are employee work targets (SKP) which contain work plans and targets to be achieved by a civil servant (PNS), and work behavior and attitudes or actions taken by civil servants.

This PP requires that every civil servant must prepare an SKP based on the agency's annual work plan. The SKP contains job duties and targets that must be achieved within a real and measurable assessment period. The disciplinary penalties imposed on civil servants who do not prepare SKP in accordance with the provisions of the legislation governing the discipline of civil servants.

In Government Regulation Number 46 of 2011 it is explained that the performance appraisal of civil servants, hereinafter abbreviated as PNS, is carried out by an Appraisal Officer once in 1 year which is carried out at the end of December of the year concerned or at the end of January of the following year. The assessment of the work performance of civil servants consists of the following elements:

1. SKP with a weighted value of 60%
2. Work behavior with a weighted value of 40%.

This needs to be done as a manifestation of the accountability principle of government organizations and one of the government's efforts to realize good governance. LAN (2004:47) defines accountability as an obligation to provide accountability and explain the performance and actions of a person/legal entity/leader of an organization to those who have the right or authority to ask for accountability. Accountability includes the success or failure of the implementation of the mission of the agency concerned. Good accountability is accountability that can show an increase in the performance of government agencies as well as positive changes in the behavior of their employees. Improving the performance of government agencies cannot be realized if there is no good management or management, which can encourage agency efforts to improve performance. Performance-based management can be used to increase the accountability of government agencies (Propper and Wilson, 2003; Kloot, 1999).

The implementation of performance-based management in the public sector was triggered by the concept of reinventing government introduced by Osborne and Gaebler (1992) where they proposed several strategies whose emphasis was on improving the performance of public sector organizations (De Bruijn, 2002, Mardiasmo, 2002; Propper and Wilson, 2003). ; Van Helden, 2005). The views of Osborne and Gaebler have influenced changes in public sector management in the world. De Nisi (in Heinrich, 2002) reveals that performance management efforts are aimed at encouraging performance in achieving the highest level of the organization. Furthermore, Propper and Wilson (2003) mention that performance management can improve overall organizational performance.

Performance-based management is the process of planning, measuring, evaluating and evaluating employee performance to realize organizational goals and optimize employee potential. Performance management is a cycle that must be built on an ongoing basis and is expected to improve the performance of both employees and the organization as a whole. Performance-based management is also expected to change employee behavior in performing in a positive direction (LAN, 2004; Propper and Wilson, 2003).

Performance-based management practices involve the specification of goals to be achieved, allocation of resources, measuring and evaluating performance (Verbeeten, 2008; Heinrich, 2002, Kloot, 1999). Target specifications are an important element in formulating policies and programs of government agencies where policies and programs are prepared to meet the needs of the community.

To realize the target, it is necessary to allocate resources. The allocation of resources in question can be in the form of allocation of funds (Propper and Wilson, 2003). The allocation of funds is distributed from the central government to regional governments, and/or from local governments to the government below which are used to fund activities that have been budgeted for by each government agency. The allocation of resources is carried out so that the government can reach and improve services in meeting the needs of the community and other stakeholders.

The challenge faced by public sector organizations is the difficulty of setting clear and measurable targets due to diverse stakeholders with various interests. Verbeeten, 2008; Rantanen, et.al, 2007; Heinrich, 2002; Kravchuk and Shack, 1996 indicate that setting clear and measurable targets can improve the performance of government agencies.

According to the Government Regulation of the Republic of Indonesia Number 30 of 2019 concerning the Performance Appraisal of Civil Servants, it is stated that the PNS Performance Appraisal Officer is the direct

superior of the PNS who is assessed with the lowest provisions being a supervisory official or other official who is delegated authority. This is also done by the Head of the Sub-Division of Personnel at the Education and Culture Office of Malacca Regency.

The results of observations made by researchers found several problems that occurred related to employee performance targets by the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency. This condition can be detected when there are still frequent errors in the execution of work, such as incoming letters or reports to be addressed in the field that should be addressed, but the wrong address still occurs and if there are documents that need to be known by the leadership, but have not been submitted. In addition, errors have also been found in archiving files. Work that should have been completed at a predetermined time has not been achieved, for example in making Employee Performance Targets (SKP) which have not been completed past the specified time limit. Whereas SKP is the determination of performance targets.

Furthermore, there are still some employees who have not used their working hours effectively. Employees often come late for various reasons, and do not come to the office without clear explanation. In addition, there are still employees who during working hours carry out other activities such as just sitting back playing cellphones, opening YouTube and chatting with colleagues, there are even employees who go to the canteen so that the employee performance target by the head of the personnel sub-section of the Education and Culture Office of Malacca Regency is appropriate. to be questioned and investigated and analyzed in more depth to achieve improved performance within the Malacca District Government. Performance can be measured/assessed by the presence of performance measurement.

In addition, an error has been found in archiving files. Work that should have been completed at the time specified has not been achieved, for example in making Employee Performance Targets (SKP) which have not been completed past the specified time limit. Whereas SKP is the determination of performance targets where for the promotion process every year there are 2 periods, namely in April and October. In the April period for the promotion process, it was found that there were 40 incomplete files due to errors in the SKP and 28 wrong files due to the credit score assessment. In the October 2020 period, there were 45 incomplete files due to errors in making SKP and 30 incomplete files due to errors in credit score assessment. In the April 2021 period, there were 45 incomplete files due to errors in making SKP and 25 credit score assessments. In the October 2021 period, there were 46 incomplete files due to errors in making SKP and 34 files on credit score assessment. These findings will be described in the following subsection table:

**Table 1.1** Incomplete Files (BTL) Process of Promotion at the Education and Culture Office of Malacca District

No.	Service	2020 period		2021 period	
		April	October	April	October
1.	Employee Performance Target	40	45	45	46
2.	Credit Score Penilaian	28	30	25	34
<b>Total</b>		<b>68</b>	<b>75</b>	<b>70</b>	<b>80</b>

*Source:* BKPSDM Malacca Regency, 2021

Another problem related to the management of the performance targets of the Head of the Sub-Division of Personnel at the Education and Culture Office of the Malacca Regency is in the matter of pensions where one of the requirements is the making of SKP for the last 2 years and it was found that in 2020 there were 35 incomplete pension files due to errors in making SKP and 20 other files. In 2021 there are 40 incomplete pension files and 27 other files with the following details:

**Table 1.2** Table of Incomplete Files (BTL) of Pensions at the Malacca District Education and Culture Office

No.	Service	2020	year 2021
	<b>Pension</b>		
1.	Employee Performance Target	35	40
2.	Other Files	20	27
<b>Total</b>		<b>55</b>	<b>67</b>

*Source:* Malacca District Education and Culture Office, 2021

Findings related to the ineffective performance targets of the Head of the Sub-Division of Personnel at the Education and Culture Office of Malacca Regency became a dilemma when Law Number 23 of 2014 concerning Regional Autonomy stated that regional governments have the task of realizing the welfare of the people in their regions through improvement, service, and development. empowerment and community participation. To achieve this, local governments are required to improve and improve their performance. One of the efforts made is to implement performance management (LAN, 2004).

Referring to the explanation related to the background, the researcher is interested in conducting a study with the title **Performance Target Management of the Head of Personnel at the Education and Culture Office of Malacca Regency**. An organization that successfully achieves its goals and can fulfill its responsibilities will depend heavily on its leaders. If the leader can carry out his role well, the organization is likely to achieve its goals. An organization needs an effective leader, who can influence the behavior of its members. A leader is a person who has skills and strengths, especially skills and strengths in one area so that he can influence others to jointly carry out certain activities to achieve goals.

A leader has a very important role in the organization's journey in achieving its goals. Therefore, it must be realized that leaders have the power to influence employees to achieve or not achieve the goals set in the company. This is what makes the theme of performance in leadership always an interesting subject of study that is always discussed (Supratman, OV., Entang, M., & Tukiran, M, 2021).

Based on the opinion of Bernardin and Russell, the management of employee performance targets by the Head of the Personnel Sub-Division of the Education and Culture Office of the Malacca Regency tends to be seen as the result of a work process whose measurements are carried out within a certain period of time where according to Armstrong (1998:16-17) there are several factors that affect the performance of employees. affect the management of the performance targets of the Head of the Personnel Sub Division of the Education and Culture Office of Malacca Regency, namely; (a) individual factors ( personal factors ) related to expertise, motivation, commitment, (b) leadership factors ( leadership factors ) related to the quality of support and direction provided by leaders, managers, or work group leaders, (c) factors group/coworkers ( team factors ) related to the quality of support provided by co-workers, (d) system factors ( system factors ) relating to existing work systems/methods and facilities provided by the organization and (e) situational factors ( contextual/situational factors) are factors related to environmental pressures and changes, both internal and external.

## 2. LITERATURE REVIEW

### A. performance

According to Bernardin and Russel (1998:239), performance can be defined as follows: " Performance is defined as the record of outcomes produced on a specified job function or activity during a time period ". Based on the opinion of Bernardin and Russell, performance tends to be seen as the result of a work process whose measurement is carried out within a certain time.

Meanwhile, according to Ilgen and Schneider (Williams, 2002:94): " Performance is what the person or system does ". The same thing was stated by Mohrman et al (Williams, 2002:94) as follows: " A performance consists of a performer engaging in behavior in a situation to achieve results ". From these two opinions, it is seen that performance is seen as a process of how something is done. So, performance measurement is seen from the good or bad of certain activities to get the desired results.

A more comprehensive opinion is conveyed by Brumbrach (Armstrong, 1998:16) as follows:

Performance means behaviors and results. Behaviors emanate from the performer and transform performance from abstraction to action. Not just the instruments for results, behaviors are also outcomes in their own right – the product of mental and physical effort applied to tasks – and can be judged apart from results.

Brumbrach, in addition to emphasizing results, also adds behavior as part of performance. According to Brumbrach, behavior is important because it will affect the work of an employee.

### B. Work Management

There are several views of experts about the notion of performance management ( Performance Management ). Bacal (1999:4) views performance management as a communication process that is carried out continuously in partnership between employees and their direct supervisors. This communication process includes activities to build clear expectations and understanding of the work to be done. The communication process is a system, has a number of parts, all of which must be included, if performance management is to provide added value for the organization, managers and employees.

In contrast to Bacal which emphasizes the communication process, Armstrong (2004:29) sees performance management as a means to get better results from organizations, teams and individuals by understanding and managing performance within a framework of goals, standards, and requirements. agreed attributes. Armstrong and Baron (1998:7) previously argued that performance management is a strategic and integrated approach to delivering sustainable success to an organization by improving the performance of the employees working in it and by developing the capabilities of the team and individual contributors. They also quote Fletcher's opinion that performance management is related to the approach of creating a shared vision of the goals and objectives of the organization, helping employees understand and recognize their part in managing and improving the performance of both individuals and organizations.

Meanwhile, Schwartz (1999:7) views performance management as a management style which is basically open communication between managers and employees regarding goal setting, providing feedback from managers to employees and vice versa from employees to managers, as well as performance appraisals. Here it appears that Schwartz sees performance management only as a management style, but in terms of substance it is similar to Bacal's view as a communication process. Costello (1994:3) states that performance management is the basis and driving force behind all organizational decisions, work effort and resource allocation.

### **C. Factors Affecting Performance**

One way that is used to improve performance is through the implementation of a performance management system (Cho & Lee, 2012; DeNisi & Pritchard, 2006; Gruman & Saks, 2011; McAfee & Champagne, 1993; Paposa & Kumar, 2015). The implementation of performance management has been proven to have a strong and consistent positive impact on improving organizational outcomes (Sun & Van Ryzin, 2014) where according to Bernardin and Russel (1998: 239), performance can be defined as follows: " Performance is defined as the record of outcomes produced on a specified job function or activity during a time period ". Based on the opinion of Bernardin and Russel, the performance target management of the Head of the Sub-Division of Personnel within the Malacca Regency Government tends to be seen as the result of a work process whose measurements are carried out within a certain period of time where according to Armstrong (1998: 16-17) there are several factors that influence the management of performance targets. employees by the Head of the Sub-Division of Personnel within the Malacca Regency Government, namely:

1. Individual factors (personal factors); Individual factors related to expertise, motivation, commitment.
2. Leadership factors (leadership factors); The leadership factor relates to the quality of support and direction given by the leader, manager, or work group leader.
3. Group factors/coworkers ( team factors ); The group/coworker factor is related to the quality of support provided by co-workers.
4. (System factors); The system factor is related to the existing work system/method and the facilities provided by the organization.
5. Situational factors (contextual / situational factors); Situational factors relate to environmental pressures and changes, both internal and external.

From the description presented by Armstrong, there are several factors that can affect the performance of an employee leader. These factors need serious attention from the leadership of the organization if employees are expected to make an optimal contribution.

### **D. Performance Assessment**

Every organization has basically identified that performance planning and the creation of an organizational achievement have a very close relationship with the individual achievements of employees. Therefore, it can be said that organizational performance is the result of cooperation between the employee concerned and the organization where the employee works. To achieve the desired work performance, the desired goals, desired work standards, supporting resources, direction, and support from the line manager of the employee concerned become very vital. In addition, the motivational aspect is an aspect involved in improving work performance. This is in accordance with the opinion of Torington and Hall (1995:316) which states that "Work performance is seen as a result of the interaction between individual abilities and motivation".

Mondy & Noe (1990:382) defines performance appraisal as: "A formal system that is carried out periodically to review and evaluate employee performance". Meanwhile, Irawan (1997: 188) argues that performance appraisal is "a way of evaluating employee performance with a certain set of objective benchmarks that are directly related to one's duties and carried out regularly". Meanwhile Levinson as quoted by Marwansyah and Mukaram (1999:103) said that "Performance assessment is a systematic description of the strengths/strengths and

weaknesses related to the work of a person or a group". The objectives of the appraisal process are stated by Alewine (1992:244) as follows: "The goal of the performance appraisal process is to make employees see themselves as they really are, recognize the need for improving work performance, and to participate in making performance improvement plans". While the general purpose of performance appraisal is to evaluate and provide constructive feedback to employees which ultimately achieve organizational effectiveness.

### **E. Employee Performance Goals**

Employee performance targets, hereinafter abbreviated (SKP) according to Government Regulation No. 46 of 2011 concerning the Assessment of Civil Servants' Work Performance, are: "work plans and targets to be achieved by a civil servant.

Every civil servant is required to compile an SKP which contains activities of job duties and targets that must be achieved within the assessment period that are tangible and measurable. The SKP that has been prepared must be approved and determined by the appraiser official as a work contract, if the SKP that has been prepared is not approved by the appraiser official then the decision is submitted to the supervisor of the appraiser official and is final.

In Government Regulation Number 46 of 2011 concerning the Assessment of Work Performance for Civil Servants, it is explained that there are several elements of employee work targets (SKP), including:

#### **1. Job Duty Activities**

Every job assignment activity to be carried out must refer to the Performance Determination (RKT), as the implementation of policies in order to achieve the goals and objectives of the organization that have been set and must be oriented towards tangible and measurable results.

#### **2. Credit Score**

A value of each item of activity and/or the accumulated value of item of activity that must be achieved by a functional official in the context of developing the career concerned is determined by the number of credit points to be achieved.

#### **3. Target**

In setting targets include the following aspects:

- a. Quantity (Target Output)
- b. Quality (Quality Target)
- c. Time (Target Time)
- d. Cost (Target Cost)

Each agency compiles and establishes technical standards for activities in accordance with the nature, types of activities and the needs of the duties of each position.

In Government Regulation No. 46 of 2011 concerning the Assessment of Civil Servants' Work Performance, it is explained that the assessment of the work performance of civil servants aims to ensure the objectivity of developing civil servants which is carried out based on the work performance system and career system that focuses on the work performance system.

The SKP is made to improve and perfect what is in the implementation of DP3 PNS which is generally directed in accordance with the demands of quality in the development of Civil Servants (PNS).

### **F. Relationship between Public Administration and Employee Performance Target Management**

Public administration has a meaning that includes stelselmatige, verkrijging en verwerking van gagevan (administration), bestuur (management of organizational activities), and beheer (management of resources, such as finance, personnel, warehouse ) (Silalahi, 2005:2 ) or in other words, namely the ability to coordinate various social forces that often conflict with one another in a single organism in such a way that these forces can move as a unit (Syafri, 2012: 09) so that it can be stated that public administration is a administrative control carried out by a government agency in order to carry out activities to achieve goals with their respective authorities in accordance with statutory regulations. Human resources of government officials are the most important thing in forming an advanced government organization both in quality and quantity.

An organization that successfully achieves its goals and can fulfill its responsibilities will depend heavily on its leaders. If the leader can carry out his role well, the organization is likely to achieve its goals. An organization needs an effective leader, who can influence the behavior of its members. A leader is a person who has skills

and strengths, especially skills and strengths in one area so that he can influence others to jointly carry out certain activities to achieve goals. A leader has a very important role in the organization's journey in achieving its goals. Therefore, it must be realized that leaders have the power to influence employees to achieve or not achieve the goals set in the company. This is what makes the theme of performance in leadership always an interesting subject of study that is always discussed (Supratman, O. V, Entang, M., & Tukiran, M, 2021).

One way that is used to improve performance is through the implementation of a performance management system (Cho & Lee, 2012; DeNisi & Pritchard, 2006; Gruman & Saks, 2011; McAfee & Champagne, 1993; Paposa & Kumar, 2015). The implementation of performance management has been proven to have a strong and consistent positive impact on improving organizational outcomes (Sun & Van Ryzin, 2014) where according to Bernardin and Russel (1998: 239), performance can be defined as follows: " Performance is defined as the record of outcomes produced on a specified job function or activity during a time period ". Based on the opinion of Bernardin and Russell, the performance target management of the Head of the Sub-Division of Personnel within the Malacca Regency Government tends to be seen as the result of a work process whose measurements are carried out within a certain period of time to serve as input for system improvement within the organization itself.

### **3. Method**

The method used in this study is a qualitative research method, with a case study approach with 29 informants with the types of qualitative data and quantitative data while the data sources in this study came from primary data sources and secondary data while the data collection method in this study was research. Field Research ( Field Research ), Library ( Library Research ) while the Data Collection Techniques in this study are observation, qualitative interviews and qualitative documents.

In analyzing the data, the data obtained by the researcher used the data analysis technique proposed by Bungin (2012:70), which is as follows:

#### **1. Data Collection ( Data Collection )**

Data collection is an integral part of data analysis activities. Data collection activities in this study were using interviews and documentation studies.

#### **2. Data Reduction ( Data Reduction )**

Data reduction is defined as the selection process, focusing on simplification and transformation of rough data that emerges from written notes in the field. Reduction is carried out since data collection begins by making summaries, coding, tracing themes, making clusters, writing memos and so on with the aim of eliminating irrelevant data/information.

#### **3. Data Display**

Display data is a description of a set of structured information that provides the possibility of drawing conclusions and taking action. The presentation of qualitative data is presented in the form of narrative text. The presentation can also be in the form of matrices, diagrams, tables and charts.

#### **4. Verification And Confirmation Of Conclusions (Conclusion Drawing And Verification )**

Is the final activity of data analysis. Drawing conclusions in the form of interpretation activities, namely finding the meaning of the data that has been presented.

### **4. RESEARCH RESULTS AND DISCUSSION**

#### **4.1 Performance Target Management of the Head of the Personnel Sub-Division of the Malacca Regency Education and Culture Office**

The implementation of performance management has been proven to have a strong and consistent positive impact on improving organizational outcomes (Sun & Van Ryzin, 2014) where according to Bernardin and Russel (1998: 239), performance can be defined as follows: " Performance is defined as the record of outcomes produced on a specified job function or activity during a time period ". Based on the opinion of Bernardin and Russell, the performance target management of the Head of the Personnel Sub Division of the Education and Culture Office of the Malacca Regency tends to be seen as the result of a work process whose measurements are carried out within a certain period of time where according to Armstrong (1998:16-17) there are several factors that influence management The performance targets of the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency are:

##### **A. Individual Factors ( Personal Factors )**

Armstrong (1998:16) sees individual factors ( personal factors ) as factors related to expertise, motivation, commitment. Sopiah (2008:166) states that employees who are highly committed to the organization will lead

to high organizational performance, reduced absenteeism, employee loyalty, and others. Work ability can affect employee performance, this statement is reinforced by the opinion of Mangkunegara (2011: 67), namely the factors that influence the achievement of performance are the ability and commitment factors.

Based on the results of observations and interviews conducted by the author, it is known that in terms of; (a) the expertise of the Head of the Sub-Division of Personnel with respect to employee performance targets is found that there are still frequent errors in the execution of work, such as incoming letters or reports to be addressed in the field that should be addressed, but the wrong address still occurs and if there are documents that need to be known by the leadership, but it hasn't been delivered yet. In addition, errors were also found in archiving files, (b) the motivation of the Head of the Sub-Division of Personnel towards employee performance targets where work that should have been completed at a predetermined time has not been achieved, for example in making Employee Performance Targets (SKP) which has not been completed. past the specified time limit. Whereas SKP is the determination of performance targets and (c) the commitment of the Head of the Personnel Sub-Section to the performance targets of employees who are still lacking so that they seem indifferent in carrying out their duties and responsibilities so that the management of the performance targets of the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency from an individual perspective can be stated. not yet effective.

Performance can be viewed from the perspective of results, processes, or behaviors that lead to the achievement of goals and if the individual side is found that the performance targets of the Head of the Personnel Sub Division of the Education and Culture Office of Malacca Regency have not been effective, the achievement of organizational goals will falter. Therefore, the task in the context of performance appraisal, the first task of the organizational leader, namely the Head of the Sub-Division of Personnel within the Malacca Regency Government, is to determine which performance perspective will be used in interpreting performance in the organization he leads (Armstrong, 1998:16).

This finding is not new regarding the performance of public sector organizations related to minimal skills, motivation, commitment due to the difficulty of setting clear and measurable targets due to diverse stakeholders with various interests. Verbeeten, (2008) Rantanen, et.al, (2007), Heinrich, (2002); Kravchuk and Shack (1996) indicated that setting clear and measurable targets can improve the performance of government agencies.

Changes in individual mindset related to expertise, motivation, commitment of the Head of Sub-Division of Personnel of the Education and Culture Office of Malacca Regency need to be carried out as an embodiment of the accountability principle of government organizations and one of the government's efforts to realize good governance . LAN (2004:47) defines accountability as an obligation to provide accountability and explain the performance and actions of a person/legal entity/leader of an organization to those who have the right or authority to ask for accountability.

## B. Leadership Factors ( Leadership Factors )

Armstrong (1998:16) sees leadership factors as factors related to the quality of support and direction provided by the leader, manager, or work group leader and in the context of managing the performance targets of the Head of Sub-Division of Personnel, leadership factors ( leadership factors ). is the quality of support and direction given by the leadership regarding the management of performance targets for the Head of the Sub-Division of Personnel.

According to the author's interview, it was found that the Regional Secretary of the Malacca Regency admitted that although leadership factors with good quality support and direction had been carried out, the performance of the Head of the Personnel Sub-Division of the Malacca Education and Culture Office was still unsatisfactory as the author's observations found thatThe work of the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency which should have been completed at a predetermined time has not been achieved, such as in making Employee Performance Targets (SKP) which have not been completed past the specified time limit, while SKP is the determination of performance targets for the process. There are 2 promotion periods every year, namely in April and October with the following details:

1. In the April 2020 period for the promotion process, it was found that there were 40 incomplete files due to errors in the SKP and 28 wrong files due to credit score assessments.
2. In the October 2020 period, there were 45 incomplete files due to errors in making SKP and 30 incomplete files due to errors in credit score assessment.
3. In the April 2021 period, there were 45 incomplete files due to errors in making SKP and 25 credit score assessments.



4. In the October 2021 period, there were 46 incomplete files due to errors in making SKP and 34 files on credit score assessment.

These findings will be described in the following subsection table:

**Table 4.6** Incomplete Files (BTL) Process of Promotion at the Education and Culture Office of Malacca Regency

No.	Service	2020 period		2021 period	
		April	October	April	October
1.	Employee Performance Target	40	45	45	46
2.	Credit Score Rating	28	30	25	34
<b>Total</b>		<b>68</b>	<b>75</b>	<b>70</b>	<b>80</b>

*Source:* Bkpsdm Malacca Regency, 2021

Another problem related to leadership factors related to the quality of support and direction of poor performance target management by the Head of the Personnel Sub-Section at the Education and Culture Office of Malacca Regency is in the matter of pensions where one of the requirements is the making of SKP for the last 2 years and found that in 2020 there are 35 incomplete pension files due to errors in making SKP and 20 other files.

In 2021 there are 40 incomplete pension files and 27 other files with the following details:

**Table 4.7** Table of Incomplete Files (BTL) of Pensions at the Malacca District Education and Culture Office

No.	Service	2020	year 2021
<b>Pension</b>			
1.	Employee Performance Target	35	40
2.	Other Files	20	27
<b>Total</b>		<b>55</b>	<b>67</b>

*Source:* Malacca District Education and Culture Office, 2021

Findings related to the ineffective performance targets of the Head of the Sub-Division of Personnel at the Education and Culture Office of Malacca Regency became a dilemma when Law Number 23 of 2014 concerning Regional Autonomy stated that regional governments have the task of realizing the welfare of the people in their regions through improvement, service, and development. empowerment and community participation. To achieve this, local governments are required to improve and improve their performance. One of the efforts made is to implement performance management (LAN, 2004) which must be carried out effectively by the leadership, namely the Regional Secretary of the Malacca Regency and the Head of the Personnel Sub-Section at the Education and Culture Office of the Malacca Regency so that it is in line with Government Regulation Number 46 of 2011 concerning Assessment The work performance of civil servants is based on the Malacca Regent Regulation Number 3 of 2013 concerning the Establishment of Organizations and Work Procedures for the Malacca Regency Regional Offices.

In this context, the leadership factors ( leadership factors ) of the Head of the Sub-Division of Personnel at the Education and Culture Office of Malacca Regency according to Kreitner and Kinicki (2010: 467) as a process in which an individual influences others to achieve common goals but these goals have not been fulfilled where performance The Head of the Sub-Division of Personnel at the Department of Education and Culture of the Malacca Regency has not been satisfied. Leadership is not only symbolic but is about influencing, motivating, and enabling others to contribute towards the effectiveness and success of the organizations of which they are members (McShane and Von Glinow, 2010:360) so that organizational performance becomes effective in accordance with organizational goals.

### C. Group Factors / Coworkers ( Team Factors )

Armstrong (1998:16) looked at group/co-worker factors ( team factors ) related to the quality of support provided by co-workers, namely the quality of support provided by co-workers regarding the management of performance targets for the Head of Sub-Division of Personnel at the Education and Culture Office of Malacca Regency.

The results of the author's observations found that there were still some employees who had not used working hours effectively. Employees often come late for various reasons, and do not come to the office without clear explanation. In addition, there are still employees who during working hours carry out other activities such as just sitting and playing with cellphones, opening YouTube and chatting with colleagues, there are even

employees who go to the canteen so that the organizational climate does not support the achievement of employee performance targets by the head of the sub-section of the personnel department of the Education Office. and Culture of Malacca Regency.

Keith Davis (1990:121) states that organizational climate is the human environment in which organizational employees do their jobs. Climate is influenced by almost everything that happens in an organization, one of which is team factors (Armstrong, 1998:16) and based on the author's observations, an organizational climate that does not support the achievement of good employee performance goals will have a bad impact. on the organizational performance of the Department of Education and Culture of Malacca Regency, especially in terms of human resources.

Human resources of the government apparatus are the most important thing in forming an advanced government both in quality and quantity ( Robbins, 2008:99) . Referring to the performance target management of the head of the personnel sub-section of the Education and Culture Office of Malacca Regency or the quality of apparatus resources can be measured from the competence possessed by employees in carrying out a government task, while in terms of the quantity of apparatus resources, the number of employees is determined by how big the institution is. in regional apparatus so that the main tasks and institutional functions of regional apparatus can be carried out

By looking at the tasks and functions carried out by each individual in the organization, optimal performance is required in achieving each of the goals that have been set (Mangkunegara, 2012: 67) , but based on the author's observations it was found that in general the performance shown by employees from the group side / colleagues ( team factors ) do not support the achievement of effective performance targets. This can be seen in the work behavior of employees in discipline which is still low where there are still many employees who do not attend the morning apple, besides that there are employees who are not in place after the break has been completed. There is still a lack of number of employees and the capabilities possessed by employees are not in accordance with the position occupied. So that it can cause the work ability of the employee is not in accordance with the field of science.

#### D. ( System Factors )

( system factors ) relating to existing work systems/methods and facilities provided by the organization Armstrong (1998:16) which in this case are work systems/methods and facilities provided by the organization to support the management of performance targets of the Head of Sub-Section staffing.

The results of the interview above and reinforced by the results of observations made by the author are known that system factors related to work systems/methods have not been effective where the Education and Culture Office of Malacca Regency does not yet have standard work SOPs, this is because the Head of the Department of Education and Culture Education and Culture of Malacca Regency Yohanes Klau, S.IP, MM is the Plt. The head of the service while the head of the definitive service has not been determined by the local government of Malacca Regency until now so that it has an impact on organizational performance which has not been effective, especially in terms of performance monitoring.

Performance monitoring by the Head of the Sub-Division of Personnel should be carried out in the following manner; (1) Performance monitoring is carried out by PNS Performance Appraisal Officers on PNS periodically and continuously in the process of implementing SKP at least 1 (one) time in each semester in the current year, (2) Performance Monitoring is carried out by observing Performance Achievements through the available performance documentation. in non-electronic information systems and/or electronic-based information systems. Performance Monitoring is used to determine the progress of civil servants' performance, so that data delays or irregularities do not occur, (3) If there are delays and/or irregularities, the head of sub-employment must immediately find the cause and try to overcome it, and accelerate so that it can achieve the goals and objectives as planned Initially, (4) In conducting Performance Monitoring, PNS Performance Appraisal Officers can be assisted by Performance Managers, (5) Performance Monitoring Results of SKP implementation based on objective evidence and changes in the organizational environment may include recommendations for SKP changes but this has not been carried out because the Head of The Education and Culture Office of Malacca Regency Yohanes Klau, S.IP, MM is the Plt. Head of department while job designis a determination functionone's work activitiesindividual or group of employeesorganizationally.

Designwork must be clear so thatemployees can work wellin accordance with the work that has beengiven to him (Handoko, 2001: 193). It is most likely that employee performance will decrease if this factor is reduced or absent and this finding supports the authors' findings where the performance target of the head of the sub-section of personnel at the Department of Education and Culture of Malacca Regency has not been achieved .

For the facilities provided, it was found that until now the Education and Culture Office of Malacca Regency still uses the Tabene Malaka State Junior High School building because it does not have its own building, while office facilities and infrastructure that experience problems will hamper employee work activities.

The supporting facilities or supporting the implementation of the functions of the Education and Culture Office of Malacca Regency are as follows:

#### 4.8 Supporting Facilities for the Implementation of the Functions of the Education and Culture Office of the Malacca Regency

Office supplies		Office equipment	
Camera	1	Bureau Desk	1
Infocus	1	Desk Bureau	20
Loudspeaker	-	Leadership Chair	1
Wireless	1	Wooden chairs	20
		Filing cabinet	5
		Computer	4
		Printer	3
		air conditioning	1
		Corner Living Sofa	2
		Plastic chair	30
		Laptop	5
Official Vehicle			
Car		Motorcycle	
Dump Truck	-	Yamaha Vixion	1
Carry	-	Honda Mega Pro	-
Kijang Inova	1	Yamaha/All New Soul	1
		Yamaha X-Ride	1

*Source:* Malacca District Education and Culture Office, 2022

Office infrastructure as an integral part of the overall activities or work activities that can support or support the implementation of the duties and functions of the work unit. In general, office infrastructure means everything that supports the implementation of a process (business or development).

Based on the author's observations, the existing infrastructure at the Department of Education and Culture of Malacca Regency is not so adequate. Infrastructure facilities such as the use of equipment, determination of appropriate equipment, operational processes and security features because they are not intended for office buildings but school buildings and this has an impact on achieving employee performance targets by the organization where employee performance is disrupted, affecting targets, quality, time and obedience. principle. Thus, work is delayed, the services provided are not optimal and the work is piling up. Performance refers to the achievement of employee goals for the assigned tasks (Wahyuni, 2014).

Good employee performance carried out in the Agency is a function and perception or impression of the infrastructure. If it meets or even exceeds expectations, the agency's performance will run well. If the performance of the agency is getting better with the performance of employees, there will certainly be a good impression of the agency (Sofyan, 2004: 22). So the performance of employees plays a very important role in measuring the success of the agency in carrying out the duties of the agency. Good employee performance can only occur if office infrastructure can support employee performance in carrying out employee duties at the agency (Minarti, 2011:259).

Buildings as a place for humans in organizations to carry out their activities have a very strategic role in character formation, embodiment of productivity, and human identity in organizations. Therefore, the management of buildings needs to be regulated and fostered for the sake of continuity and improvement of people's lives and livelihoods as well as to realize buildings that are reliable, have an identity, and are balanced, harmonious, and in harmony with their environment.

#### E. Situational Factors ( Contextual / Situational Factors)

Situational factors ( contextual/situational factors) are factors related to environmental pressures and changes, both internal and external (Armstrong, 1998:16) which in this case is the influence of pressure and

environmental changes, both internal and external environments affecting performance target management Head of Sub Division of Personnel.

Based on the results of the interview, it is known that the external factors that affect the achievement of the performance targets of the head of the sub-section of the staffing of the Department of Education and Culture of the Malacca Regency have not been achieved due to the unsupportive and uncomfortable work environment as well as styles and changes in leadership.

This finding is in line with Timpe's opinion in Mangkunegara (2006:15) which states that external factors that affect a person's work performance come from the environment. Such as the behavior, attitudes, and actions of co-workers, subordinates or leaders, work facilities, and organizational climate.

Meanwhile, to find out the situational factors ( contextual/situational factors) (Armstrong, 1998:16), namely factors related to pressure and changes in the external environment caused by the influence of the quality and quantity of human resources, poor work ethic and lack of work discipline and findings This is in line with Timpe's opinion in Mangkunegara (2006:15) which states that internal (dispositional) factors that affect work performance consist of internal factors, namely factors associated with a person's characteristics. For example, a person's work performance is good because he has high abilities and someone is a hard worker type, while someone has poor work performance because the person has low abilities and the person does not have efforts to improve his abilities so that the work environment of the Malacca District Education and Culture Office must be repaired.

The non-physical work environment (work atmosphere) includes work relations between employees and work procedures. To be able to complete the work within the stipulated time, it is necessary to have work arrangements so that each employee has responsibility for the tasks assigned and directly trains them to be skilled at working in their respective fields. This work arrangement or work procedure is very necessary, so that there is no overlap in carrying out the work. Good work procedures are based on the expertise or skills of employees, so that the ability to complete work for each employee can lead to job satisfaction which ultimately affects the work of the employee concerned. (Heidjrachman and Suad Husnan, 2000: 187).

#### **4.2 Inhibiting Factors Management of Performance Targets of the Head of the Personnel Sub Division of the Education and Culture Office of Malacca Regency**

Based on the results of research on the achievement of the performance targets of the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency, several inhibiting factors were found, namely as follows:

##### **1. Regional Head 'S Political Will**

In the 2020 Pilkada, the Malacca Regency has a new regent who will lead the Malacca Regency from 2021 to 2026, but human resource development has not yet become the political will of the regional head and this is proven by the vision and mission that was initiated and did not elaborate on the development of OPD, especially in management development. ASN human resources, therefore, political will must be an attribute possessed by each individual political actor, meaning that every political actor has the will and knowledge to understand the purpose of the political will so that political will does not become a political will, but a collective will. common (Abazovic, Dino, 2015)

Lack of political will is often referred to as a serious problem, but it is poorly understood and under-analysed, while the will of the political authorities (the Regent of Malacca) if it involves the public (OPD) will have an impact on policy as well as build culture , mentality, ethics and empower OPD human resources. itself so that the quality management of the human resources of the state civil apparatus will be guaranteed through the achievement of effective employee performance targets.

Indicators of political will ideally include government efforts to actively initiate sanctions for non-compliance with governance principles (Ferris et al, 2005).

##### **2. Minimal Budget**

The budget is a managerial plan for action to facilitate the achievement of organizational goals. The existence of limited funds owned by the government is the reason why budgeting is the most important mechanism for allocating resources.

Budget problem is an important problem in organizational development. This then affects the ineffectiveness of administrating employee data so that errors often occur in decision making, employee status and employee promotion by the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency

Therefore, according to Hadija Matimbwa and Orest Sebastian Masue. (2020) top management must provide the necessary financial and psychological resources to produce qualified organizational performance in which the amount of budget allocations sourced from the government and other legitimate sources of income for the field of education for 5 (five) years can be seen in year I in the table 4.9 below:

**Table 4.9** source and amount of Education Funding for Education and Culture Office, Malacca Regency 2021-2026

YEAR	DISTRICT APBD. (Rp)	PROV budget. (Rp)	State Budget (Rp)	BLN/PLN (Rp)	TOTAL (Rp)
2017	2,200,734,346	-	175,214,991,967	-	-
2018	161.435.647.316	-	-	-	-
2018	212,027,166,756	-	-	-	-
2020	213,293.938,106	-	-	-	-
2021					

**Source:** Planning Sub-Section and Reporting Department of Education and Culture, Malacca Regency, 2022

The data in table 4.9 above shows that the total budget allocation for the education sector for five years will increase or decrease significantly at the end of the 2017-2021 period, both Regency APBD, Provincial APBD, APBN and foreign aid funds. This is caused by several things, namely; 1). Changes in the distribution of Basic Education BOS funds that are transferred directly to the Regional Treasury account; 2). Changes in the Certification Fund transferred to the regional treasury account; 3) Changes in Non-Certification Funds transferred to regional treasury accounts.

If the amount of the allocation fund above is adjusted to the problems faced, then the budget allocation is still unable to improve the quality of services and fulfill the needs of facilities and infrastructure optimally in accordance with the targets to be achieved. Therefore, the budget allocated must be in accordance with the targets that have been set to resolve the problem of not achieving performance targets by the Head of the Personnel Sub-Division of the Education and Culture Office of the Malacca Regency.

### 3. There is No Permanent Building

Buildings as a place for humans in organizations to carry out their activities have a very strategic role in character building, embodiment of productivity, and human identity in organizations.

Based on the results of interviews, observations and document searches carried out by the author, it is known that one of the inhibiting factors for achieving performance targets by the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency is a building that is not comfortable because it still uses school buildings while the building is a place for humans to live. the organization carries out its activities, has a very strategic role in character formation, the realization of productivity, and human identity in the organization so that it has an impact on the achievement of performance targets by the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency.

### 4. Lack of Quality of Human Resources (Brainware)

In this case, one of the factors in achieving the performance target by the Head of the Personnel Sub-Division of the Education and Culture Office of Malacca Regency is influenced by human resources. SIMPEG can only operate when enabled by human resources.

In carrying out its main tasks and functions, the Malacca Regency Education and Culture Office is supported by the number of employees which in 2021 are 33 people who can be classified as follows:

**Table 4.10** Number of Employees of the Education and Culture Office, Based on Employee Status

No.	Employee Status	Number of people)
1	Civil Servants (PNS)	30
2	Candidates for Civil Servants (CPNS)	3
3	Regional Contract Workers (TEKDA)	-
<b>Amount</b>	<b>33</b>	

**Source:** Sub Division of Personnel and General Department of Education and Culture, Malacca Regency. 2022

Of the 33 civil servants (PNS), they can be classified based on rank/group as follows:

**Table 4.11** Number of Civil Servants at the Education and Culture Office of Malacca Regency by Rank and Group

No.	Rank	group	Number of people)
1	builder	IV/a	3
2	Kindergarten stylist. I	III/d	6
3	stylist	III/c	3
4	Young Stylist Tk. I	III/b	6
5	Young stylists	III/a	7
6	Kindergarten Manager. I	II/d	-
7	Regulator	II/c	6
8	Kindergarten Young Organizer. I	II/b	1
9	Young Organizer	II/a	1
<b>Amount</b>	<b>33</b>		

**Source:** Sub Division of Personnel and General Department of Education and Culture, Malacca Regency, 2022

Based on the level of education, the number of civil servants at the Department of Education, and Culture, Malacca Regency on average has a bachelor's degree and senior high school education with the following details:

**Table 4.12** Number of Civil Servants of the Malacca District Education, Culture, Youth and Sports Office by Education Level

No.	Level of education	Number of people)
1	S2	1
2	S1	13
3	Diploma	1
4	high school	18
5	junior high school	-
6	SD	-
<b>Amount</b>	<b>33</b>	

**Source:** Sub-Division of Civil Service and General Affairs, Education and Culture Office, Malacca District, 2022

In the table it is known that the education level of the majority of employees at the Education and Culture Office of Malacca Regency is SMA with a total of 18 people so that it affects the lack of achievement of performance targets by the Head of the Personnel Sub-Division of the Malacca Regency Education and Culture Office.

The results of the author's observations also support the results of interviews conducted with the Regional Secretary of the Malacca Regency where the performance targets of the head of the personnel sub-section of the Malacca Regency Education and Culture Office were not achieved due to the influence of the quality and quantity of human resources, poor work ethic and lack of work discipline. and this finding is in line with Timpe's opinion in Mangkunegara (2006:15) which states that internal (dispositional) factors that affect work performance consist of internal factors, namely factors associated with one's characteristics. For example, a person's work performance is good because he has high abilities and someone is a hard worker type, while someone has poor work performance because the person has low abilities and the person does not have efforts to improve his abilities so that the work environment of the Malacca District Education and Culture Office must be repaired.

## 5. CONCLUSION

Based on the results of research and discussion in the previous chapter, the following conclusions can be drawn:

1. The management of employee performance targets by the Head of the Personnel Sub Division of the Education and Culture Office of Malacca Regency tends to be seen as the result of a work process whose measurements are carried out within a certain period of time where according to Armstrong (1998:16-17) there are several factors that influence the performance target management of the Head of Sub-District. The Personnel Section of the Education and Culture Office of Malacca Regency with the findings, namely; (a) individual factors ( personal factors ) related to expertise, motivation, performance commitment of the Head of Sub-Division of Personnel of the Education and Culture Office of Malacca Regency which are still lacking, (b) leadership factors ( leadership factors ) that have not been effective, (c) group factors /coworkers ( team factors ) with minimal support quality, (d) system factors ( system factors ) related to systems/work

methods without SOPs and non-existent building facilities (e) situational factors ( contextual/situational factors) , namely the environment internal, namely the quality and quantity of human resources, poor work ethic and work discipline that is still lacking and external in the form of changes in leadership and leadership styles.

2. The inhibiting factors for the management of the performance target of the Head of the Sub-Division of Personnel at the Education and Culture Office of Malacca Regency are; the political will of the regional head, minimal budget, the absence of permanent buildings and the quality of human resources.

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- Minister of Home Affairs Regulation Number 7 of 2006 concerning Standardization of Regional Government Work Facilities and Infrastructure
  - Malacca Regent Regulation No. 3 of 2013 concerning the Establishment of Organizations and Work Procedures of Malacca District Offices

## PARTICIPATORY PLANNING IN THE DEVELOPMENT PLAN FOR THE REGIONAL MEDIUM TERM OF MALACCA REGENCY

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### ABSTRACT

*The establishment of Malacca Regency as a new autonomous region is an opportunity for regions to be able to show performance in order to improve welfare. Public territory, so that will be able to create a good local governance in the preparation of the RPJMD in Malacca Regency which should have been prepared by taking into account the internal and external conditions of the region which were summarized in strategic issues through analysis. An analysis of the internal conditions of the region will identify the potential of the region it has and the problems it faces.*

*The method used in this study is a qualitative research method, with a case study approach with 29 informants with the types of qualitative data and quantitative data while the data sources in this study came from primary data sources and secondary data while the data collection method in this study was research. Field Research ( Field Research ), Library ( Library Research ) while the Data Collection Techniques in this study were Observation, Qualitative Interviews and Qualitative Documents. Furthermore, the data obtained by researchers used the data analysis technique proposed by Bungin (2012:70), namely; Data Collection ( Data Collection ), Data Reduction ( Data Reduction ), Data Display and Verification and Confirmation of Conclusions ( Conclusion Drawing and Verification ).*

*The results of the study showed that the participatory planning steps in the preparation of the Malacca District Medium-Term Development Plan 2021-2026 were analyzed using Abe's opinion (2002:71) with the conclusion that the participatory planning steps in Malacca District were not prepared from the bottom up ( bottom up ) but planning at the initiative of the local government so that at the stage of investigation, problem formulation, identification of carrying capacity, formulation of goals, setting detailed steps and designing a budget, it does not fully involve community participation which in the end has an impact on the proposed activities not really in accordance with what the community wants and needs.*

*Keywords: Planning, Region, Participation and Society*

### 1. PRELIMINARY

Democratic government is a form of government in which the formulation of policies, directly or indirectly, is determined by the majority vote of citizens who have the right to vote and be elected, through a forum for forming their voices in a free and non-coercive state (Hadiwijoyo, 2012: 33). And as the embodiment of democratic governance, Indonesia implements the concept of decentralization as a concept that implies the delegation of authority from the central government to lower-level governments to manage its own territory.

Reason main a number of Country developing including Indonesia for adopting a decentralization policy is to achieve an allocation of the provision of goods and service public which more efficient, create government which has a responsibility and accountability movement, and encourages the process of democratization in the regions (Marijan, 2010:139).

The decentralization scheme that was put into effect at the beginning of the reform era had a major impact on regional development planning. The development planning system, which was initially top-down in nature, gradually turned into bottom-up through several legal instruments that were developed during the era of development planning regime government reform. Process planning development which Top down is often seen as a process that is contrary to the concept of reform, which is based on bottom up public participation. As a result, the Musrenbang-based planning process (Development Plan Deliberations) in stages affect the budgeting model used. In an effort to compile a planning document, the Law requires a comprehensive and cross-stakeholder planning process to be carried out ( stakeholders ). Of course just, program the possible to do with the existence institution which play a role as coordinator, that is Planning Agency Development Area (Bappeda).

Decentralized regional development planning opens a new era for local government, especially for the local government of Malacca Regency which is the New Autonomous Region in Indonesia because it was only established in 2013 in line with the enactment of Law of the Republic of Indonesia Number 3 of 2013 concerning the Establishment of Malacca Regency in Nusa Province. East Southeast.

The establishment of Malacca Regency as a new autonomous region is an opportunity for regions to be able to

show performance in order to improve welfarePublicterritory,so thatwillcapablecreatedelementgood localgovernance .And this thing hassupported by political will from the government through the implementation of regional autonomy policies based on Law Number 23 of 2014 concerning Regional Government.

The process of preparing the Malacca District planning document must be carried out in a hierarchical manner . The preparation of the Regional RPJP must refer to the National RPJP, the regional RPJM must refer to the Regional RPJ P and pay attention to the National RPJM . The RPJM D is then translated into the Regional Government Work Plan ( RKPD ) . Then the preparation of the Regional Strategic Plan and referring to the R PJMDwhich contains the elaboration of the vision, mission, and program of the Regional Head which contains objectives, targets, strategies, policy directions, regional development and regional finance as well as regional and cross regional apparatus programs accompanied by an indicative funding framework that is carried out directly by the regional government as well as those taken by encouraging community participation with details as below:

The Malacca District RPJMD 2021-2026 is an integrated part of the national development planning and regional development planning of the East Nusa Tenggara Province. The preparation of the Malacca District RPJMD for 2021-2026 is guided by the 2005-2025 National RPJP, 2020-2024 RPJMN, 2008-2028 National RTRW, East Nusa Tenggara Province RPJMD 2018-2023, East Nusa Tenggara Province RTRW 2010-2030, Malacca Regency RPJPD 2005-2025 and Malacca Regency Spatial Plan 2017-2037. In order for the Malacca Regency RPJMD for 2021-2026 to be aligned and in line with national development policies, it is necessary to conduct a study of the national development that has been stipulated in the RPJMN that relates to and or affects regional development. In addition, studies also need to be carried out on other regional RPJMDs.

The Medium Term Development Plan of the Malacca Regency for 2021-2026 serves as a guide in the preparation of the regional apparatus organization planning document, namely the Regional Apparatus Strategic Plan (Renstra-PD) for 2021-2026 as well as the preparation of the regional government annual document, namely the Regional Government Work Plan (RKPD) which compiled every year. Furthermore, the RKPD document becomes a guideline in the preparation of budgeting documents such as the General Policy document for the Regional Revenue and Expenditure Budget (KUA), Temporary Budget Priorities and Ceilings (PPAS), Work Plans and Budgets for Regional Apparatus Work Units (RKA- SK PD), Revenue and Expenditure Budgets Regional Budget (APBD) and Budget Implementation Documents for Regional Apparatus Work Units (DPA- SK PD).

The preparation of the RPJMD in Malacca Regency is prepared by taking into account the internal and external conditions of the region which are summarized in strategic issues through analysis. An analysis of the internal conditions of the region will identify the potential of the region it has and the problems it faces. Regional internal conditions include physical and environmental conditions, regional economy, regional finance, population, socio-culture, regional facilities and infrastructure, government and security and politics. Meanwhile, the external conditions of the region will be both opportunities and challenges for the development of the region concerned. Regional external factors include regional, national and international external conditions that affect conditionsregion.

Good planning is needed in every development implementation carried out by the village government together with stakeholders. Planning that includes long, medium and short term planning is needed so that development can run on the right track. Development itself has a goal that is none other than to create a just, prosperous and prosperous society. Therefore, to achieve the success of the development, there are many aspects or things that must be considered. One of them is community involvement in development (participation). Especially at the planning stage which is the most vital stage in the development process, because planning is something that really determines the success of development.

The preparation of development planning documents in Malacca Regency was carried out using a perspective and participatory approach. The perspective approach is carried out by means of the local government formulating a development program plan that is considered very necessary for the community to improve their welfare. The participatory approach is carried out by involving all elements of society and stakeholders in development planning through the activities of the Public Consultation Forum and Development Planning Deliberation (Musrenbang).

From the presentation of the picture above, it can be seen that the space for community participation in the planning process is the implementation of the Public Consultation Forum and the Implementation of the Development Planning Deliberation (Musrenbang).

Based on the assumption of development experts that the higher the community's awareness or participation in the planning process, the more optimal output will be. The higher the level of community participation in development, the higher the level of success that will be achieved. This shows that community participation and sustainable development are two terms that cannot be separated. This opinion is rationally acceptable because basically the purpose of development is for the welfare of the community, so it is proper for the community to be involved in the development process, or in other words, community participation is the key word for successful development (Arif, 2006: 149-150).

However, the problem with community participation in the Malacca District RPJMD planning process is still minimal because the presence of participants in participatory planning activities does not yet represent all elements of the community so that it has an impact on not synchronizing planning at the district level with the village. At the Public Consultation Forum for the Initial Draft RPJMD Period 2021-2026 as part of Participatory Planning in the preparation of the RPJMD, it had been carried out at several points with the presence of participants consisting of Members of the Regional Representative Council, Regional Apparatus, Camat, Village Heads and several community leaders while at the stage of preparing the RPJMD the previous period was only carried out once at the district level and the participants were limited.

Based on these problems, the researchers conceptualized that in participatory planning for the preparation of The Malacca District Medium-Term Development Plan requires a division of budget allocations for each sub-district for 5 years as an effort to increase the role of the community in the preparation of the RPJMD and there can also be synchronization and synergy between district and village planning or in other words an indicative ceiling per sub-district with calculations using several criteria, for example, the area of the sub-district, the number of villages, the number of residents, such as the calculation of financial assistance to political parties at the district/city level that get seats in the district/city DPRD in the amount of Rp. 1,500.00 (one thousand five hundred rupiah) per valid vote as stipulated in Permendagri 36 of 2018 concerning Procedures for Calculation, Budgeting in Regional Revenue and Expenditure Budgets, and Orderly Administration of Submission, Distribution, and Accountability Reports on the Use of Political Party Financial Aid, so it is hoped that this research will become input or recommendations for the preparation of the Draft RPJMD for the Regency of Malacca for the 2021-2026 period and the RPJMD for the following periods.

By referring to the theoretical, normative and empirical explanation above, prospective researchers are interested in conducting research with the title **Participatory Planning in the Preparation of the Medium Term Development Plan of Malacca Regency.**

Participatory planning is a planning that involves all (the people) in order to solve the problems faced which aim to achieve the desired conditions. Meanwhile, according to Abe (2002:81), participatory planning is planning that in its aim involves the interests of the people, and in the process involves the people, either directly or indirectly. The goals and methods must be viewed as a single unit, where a goal is aimed at the interests of the people and if it is formulated without involving the community, it will be difficult to ensure that the formulation will favor the community.

Furthermore, according to Abe (2002:71), the steps of participatory planning go through several stages, namely; (a) investigation, (b) problem formulation, (c) identification of carrying capacity, (d) formulation of objectives, (e) setting detailed steps and (f) designing budget. In this theory, the community has the opportunity to express their aspirations and demands to be programmed and budgeted in the APBD, as well as wide opportunities for local governments and DPRD to hear, collect, and fight for the aspirations and needs of the community to become programs that are able to improve services and public welfare. This means that the community and local government must work together in an effort to improve the welfare of the community.

Through a participatory planning forum in the preparation of the Malacca District Medium Term Development Plan, group members in the community will learn from each other through a learning by doing approach towards the goal of improving a better quality of life. What happens is that there is a change in knowledge, skills and attitudes which are potential for development at the local level, namely Malacca Regency.

## 2. LITERATURE REVIEW

### A. Development Planning

Quoted from Abidin (2008:21-22), according to Katz that development as a "dynamic change of a whole society from one state of national being to another, with the connotation that the state is preferable". In this concept, there are four aspects that need to be noted. First, development is a dynamic change (a dynamic change). Second, change does not only occur in a group of people or an area, but takes place in the whole

society ( a whole society ). Third, change takes place gradually, from one state to a new state. And fourth, the new state is preferable to the previous state.

Participatory development is development that positions the community as the subject of a development program that is intended for their own interests. Community involvement starts from the planning-implementation-monitoring-evaluation stages. In addition, mass mobilization is needed if the program is labor intensive (Cahyono, 2006:1).

According to Assauri (2003), quality is the factors contained in an item or result that causes the goods or results to be in accordance with the purpose for which the goods or results are intended or needed. So that development as a change will be preferred because it can improve the quality of people's lives.

Talking about regional development planning is certainly inseparable from the concept of planning. Where the term planning is very common we hear in everyday conversation. Planning comes from the word plan, which means the design or framework of something to be done.

In simple terms, planning is an activity carried out for a better future by taking into account current and previous conditions. From this simple understanding, the important components can be described, namely goals (what is to be achieved), activities (actions to realize goals), and time (when, when the activity is to be carried out). Thus, a plan can be understood as a response (reaction) to the future (Abe, 2005:57).

Quoted from Conyers (1994:4), according to Waterston planning is a conscious, organized, and continuous effort to choose the best alternative from a number of alternatives to achieve certain goals. So actually the meaning of planning really depends on the paradigm adopted. Quoted from Hadi, according to Davidoff, et al (2005:19) that from the perspective of the rational paradigm it provides limitations on planning as a process to determine the future through a sequence of choices. Then according to Dror in Hadi (2005) planning is a process to prepare a set of decisions to take future actions. Meanwhile, according to Fridman in Hadi (2005), planning is a strategy for previous decision making as an activity about decisions and implementation. From these several definitions, it is clear that planning can be seen as a form of strategy applied to both public and private organizations.

If it is associated with regional development planning, then regional development plans are related to national development. Therefore, regional development planning in addition to describing local interests is also an elaboration of central (national) planning.

According to Abe (2002:30) there are two kinds of regional planning:

1. Regional planning as a form of planning (development) which is the implementation or elaboration of central (national) planning. In this case, two possibilities can occur, namely (1) regional planning is part of central planning and (2) regional planning is an explanation of national plans implemented in the regions. The preparation process can be done through top down or bottom up .
2. Regional planning as a result of regional struggles in formulating local interests. In this matter there are two possibilities, namely (1) regional planning as a pure formulation of regional interests without regard to corridors from the center and (2) regional planning is nothing more than an opportunity given by the center to be filled by the regions.

Planning according to Terry (1991: 34) is an attempt to use assumptions about the future by describing and formulating the activities needed to achieve the desired results. Meanwhile, Siagian (1980:18) defines planning as the whole process of thinking and determining carefully the things that will be done in the future in order to achieve the goals that have been set.

Conyers and Hill (1991:142) define planning as a continuous process that includes decisions or choices of various alternative uses of resources to achieve certain goals in the future. From a political perspective, Supriyatno (2009:66) defines planning as a process of consensus between groups of citizens and also a consensus between the state played by the head of government and its citizens, where the consensus will give birth to public decisions. Therefore, planning is absolutely necessary in every activity, including regional development, because without planning activities there will be confusion which will eventually lead to various negative things such as: overlapping , unclear directions, and so on which will result in waste.

Basically planning as a management function is a decision-making process from a number of options, to achieve a desired goal. Development planning in general must have, know, and take into account several main elements, namely:



1. The ultimate goal to be achieved
2. Goals and priorities to realize the ultimate goal
3. The timeframe required to achieve these goals
4. Problems encountered
5. Capital or resources to be used and their allocation
6. Wisdom to make it happen
7. Person, Organization, or implementing body
8. Mechanisms for monitoring, evaluating, and supervising implementation

The emergence of the idea of regional development planning according to Ketaren (2009: 48) originated from the view that national development planning is not effective enough to understand the needs of citizens who live in an administrative area in the context of regional development, in addition to the emergence of national government policies that provide more authority. broadly to local government administrators in the context of implementing decentralization policies.

Development Planning according to Ketaren (2009:46), defines development planning in general as:

1. Political process, namely in order to harmonize differences of views among political interests to make consensus.
2. The economic process, namely in the context of preparing a planned development to make a measurable development plan.
3. The administrative process, namely in the context of carrying out development planning to ensure the effectiveness of the implementation of development planning.

Meanwhile, development planning according to Nasution (2008:105) is an early stage in the development process. As an initial stage, development planning will become a guideline or basic reference for the implementation of development ( action plan ). Therefore, development planning should be implementable (can be implemented) and applicable (applicable).

In general, regional development planning according to Nasution (2008) is defined as a process and mechanism for formulating long, medium, and short term plans in the regions that are linked to regional conditions, aspirations, and potentials by involving community participation in order to support national development. Meanwhile, practically, according to Nasution (2008), that regional development planning is defined as a systematic effort of various actors, both public (public) or government, private and other community groups at different levels to deal with interdependence and interrelationships. other environmental aspects by:

1. Continuously analyze the conditions and implementation of regional development.
2. Formulate regional development goals and policies.
3. Develop the concept of strategies for solving problems (solutions).
4. Implement using available resources.
5. So that new opportunities to improve the welfare of local communities can be captured in a sustainable manner.

Meanwhile, according to Nurcholis (2008: 18) argues that district/city development planning is the entirety of development policies, programs, and activities arranged in planning documents in a systematic, integrated, consistent, and tiered manner according to a certain period of time. The district/city development planning is structured in a framework to ensure the linkages and consistency between planning, budgeting, implementation, and supervision of development in the district/city in realizing the expected condition of the district/city (vision, mission and objectives).

Likewise, according to Nurcholis (2008: 18), that development planning is a process to determine appropriate future actions, through a sequence of choices, taking into account available resources, which are outlined in a document as a guide for development actors to achieve state goals. This development plan is made at the national and regional (provincial and district/city) levels.

Specifically to straighten the understanding and implementation of development planning in Indonesia, Law Number 25 of 2004 concerning the National Development Planning System defines development planning as a National Development Planning System (SPPN) is a unitary development planning procedure to produce long-term development plans. , medium and annual term, which is carried out by elements of state and community administrators at the central and regional levels.

Then in the Minister of Home Affairs Regulation Number 86 of 2017 concerning Procedures for Planning, Controlling and Evaluation of Regional Development, Procedures for Evaluation of Draft Regional Regulations concerning Regional Long-Term Development Plans and Regional Medium-Term Development Plans, as well as Procedures for Amending Regional Long-Term Development Plans, The Regional Medium-Term Development Plan, and the Regional Government Work Plan state that regional development planning is a process of compiling the stages of activities involving various elements of stakeholders in it, in order to utilize and allocate existing resources, in order to improve social welfare in an environment. / area of the region within a certain period of time.

In accordance with Law Number 25 of 2004 concerning the National Development Planning System, in order to encourage an integrated and efficient development process, basically the national development planning in Indonesia has 5 main objectives and functions, namely as follows:

1. Support coordination among development actors.
2. Ensure the creation of integration, synchronization and synergy between regions, time and government functions, both central and regional.
3. Ensure linkages and consistency between planning, budgeting, implementation and monitoring.
4. Optimizing community participation in development planning.
5. Ensure the achievement of efficient, effective and fair use of resources.

This is reinforced by the argument of Abe (2005:32) who asserts that regional planning is a way to strengthen community initiatives. Abe's idea is certainly parallel to his previous argument which states that regional autonomy also means a vehicle for strengthening local institutions. Strong local institutions are certainly the basis for community initiatives and participation.

The principle of regional development planning is in accordance with the Regulation of the Minister of Home Affairs Number 86 of 2017 concerning Procedures for Planning, Controlling and Evaluation of Regional Development, Procedures for Evaluation of Draft Regional Regulations concerning Regional Long-Term Development Plans and Regional Medium-Term Development Plans, as well as Procedures for Changes in Development Plans Regional Long Term, Regional Medium Term Development Plans, and Regional Government Work Plans include:

- a. It is an integral part of the national development planning system
- b. Conducted by the local government together with stakeholders based on their respective roles and authorities
- c. Integrating spatial plans with regional development plans
- d. It is carried out based on the conditions and potentials of each region, according to the dynamics of regional and national development.

Regional Development Planning is formulated as follows:

- a. Transparent
- b. Responsive
- c. Efficient
- d. Accountable
- e. Participatory
- f. Measurable
- g. fair
- h. Environmentally friendly

According to the Minister of Home Affairs Regulation Number 86 of 2017 concerning Procedures for Planning, Controlling and Evaluation of Regional Development, Procedures for Evaluation of Draft Regional Regulations concerning Regional Long-Term Development Plans and Regional Medium-Term Development Plans, as well as Procedures for Amendment to Regional Long-Term Development Plans, Plans Regional Medium-Term Development, and Local Government Work Plans, stated that the scope of regional development planning is:

- a. Regional Long-Term Development Plan (RPJPD).
- b. Regional Medium Term Development Plan (RPJMD).
- c. Strategic Plan (Renstra) for Regional Work Units
- d. Regional Work Plan (RKPD)
- e. Regional Work Unit Work Plan (Renja SKPD)

### **B. Participatory Mid-Term Development Planning**

In line with giving full trust to the regions to carry out government affairs that are handed over to the regions, the making of development plans must provide broad flexibility and opportunities for the community to be involved in the regional development process. Community involvement is very important because basically the main actors of development in the regional autonomy system are the community. In this case, the community must be positioned not only as an object of development but must be empowered as a subject of regional development.

According to Sjafrizal (2009:46) the development planning process of an area must be carried out through a series of deliberation forums involving all elements of stakeholders in the local area. These stakeholder elements include elements of community members, community institutions, district government officials (especially related SKPDs), NGOs and other related institutions. This development planning process is intended as a model for participatory development planning.

Participatory planning is a planning that involves all (the people) in order to solve the problems faced which aim to achieve the desired conditions. Meanwhile, according to Abe (2002:81), participatory planning is planning which in its aim involves the interests of the people, and in the process involves the people, either directly or indirectly. The goals and methods must be viewed as a single unit, where a goal is aimed at the interests of the people and if it is formulated without involving the community, it will be difficult to ensure that the formulation will favor the community.

Participatory development planning is a development planning model that includes the community (Nurcholis, 2008:11). Where in this case the community is actively involved in identifying problems, formulating problems, searching for alternative solutions to problems, preparing a solution agenda, being involved in the process of drafting (conversion), participating in monitoring implementation, and actively participating in conducting evaluations. Community involvement is represented by community groups consisting of political groups, interest groups, and pressure groups.

Participatory planning thinking begins with the realization that the performance of a community development initiative is largely determined by all parties involved with the initiative. Since the introduction of this participatory planning model, the term “stakeholders” has become very widespread and is finally considered an idiom. In short, participatory planning can be defined as planning that involves the participation of all stakeholders in the planning decision-making stage that provides space for public participation.

This participatory planning can also be viewed as an instrument of collective social learning through interactions between all development actors. This learning will ultimately increase the capacity of all stakeholders in an effort to achieve development goals, directions and targets. Apart from being a political process, participatory planning is also a technical process. In this process, the emphasis is on roles and capacities facilitator to define and identify stakeholders appropriately. In addition, this process is also directed at formulating problems collectively, formulating strategies and collective action plans, and mediating conflicts of interest in the use of public resources.

### **C. Participatory Planning Mechanism**

Participatory planning is a tangible manifestation of the change in the paradigm of centralized planning into participatory planning. The active role of the community and stakeholders in the musrenbang is a form of community participation, as a form of community demands regarding participation, transparency, and accountability. The basic essence of participatory planning is the existence of guarantees and rights of citizens from the proposed participatory musrenbang to the certainty of regional budgeting/APBD, the form of

consistency of musrenbang into planning documents, and consistency between planning documents into APBD. The official systems and procedures used in participatory planning are through musrenbang which are designed in a participatory manner.

Nurcholis (2008:34) states that district development planning uses a framework called participatory development planning. Participatory development planning requires active and optimal involvement of all stakeholders in the district, their involvement is to get aspirations and create a sense of belonging. District/city governments in making plans must still refer to provincial development documents and national development planning documents. So, participatory development planning combines a planning process that moves from the bottom up ( bottom-up ) and a planning process that moves from the top down ( top down ).

Furthermore, according to Abe (2002:71), the planning steps that are prepared from the bottom ( bottom up ) and not from planning on the initiative of the local government are as follows:

#### a. Investigation

Investigation is a process to find out, explore, and collect local problems that develop in the community. The research here is not an academic activity, but an activity that is part of the change effort. In this process, community involvement is a non-negotiable key factor. Thus, the investigation process is a process of inviting the community to carefully identify the problems they face.

#### b. Formulation of the Problem

Problem formulation is an advanced stage of the results of the investigation. The data or information that has been collected is then processed in such a way that a more complete, complete, and in-depth picture is obtained.

For To reach the formulation, basically an analysis process is carried out on information, data, and people's life experiences. The analysis process itself is meaningful as an action to find a connection between one fact and another. What is formulated must be simple, clear, and concrete. In order for the problem formulation to reflect the needs of the community (society), there is no other way but to involve the community in the process.

The first step that must be taken is to ensure that the input data collected is truly what is felt and what is the concern of the community. In this case, not all what is conveyed by the community must be accepted, it is precisely at that time that the momentum for the community together chooses which aspects are needs and which are just wants. A desire, of course, has a high degree of subjectivity, and tends to have no clear boundaries. Therefore, what will be a priority is to answer the basic needs of the community.

#### c. Identification of Carrying Capacity

In this case, carrying capacity is not defined as concrete funds (money), but all aspects that can enable the implementation of activities in achieving the goals and targets that have been set.

Carrying capacity is very dependent on (1) the problems faced, (2) the goals to be achieved, and (3) the activities to be carried out. Clarity about these aspects will basically be very helpful in understanding what is owned by the community. The carrying capacity referred to in this problem can have two meanings, namely (1) concrete, actual, available carrying capacity and (2) potential carrying capacity (will exist or can be cultivated). An understanding of the carrying capacity is needed so that the work plan that is prepared is not arbitrary, but is actually the result of an accurate calculation.

#### d. Goal Formulation

A goal is a condition to be achieved, a desired state (expected), and therefore a number of efforts are made to achieve it. To produce an effective development program, the conditions are as follows:

1. Transparent, that the decision-making processes and mechanisms that have been built since starting at the village level, it is known and can be monitored by the community.
2. Responsive, that the resulting development program is more due to efforts to respond to what is an issue in the community, not because of the design of certain parties.
3. Participatory, community involvement becomes a necessity in the sense that the formulation is carried out together and always pays attention to the problems/issues raised by the community.
4. Accountable, as long as the entire process is carried out transparently, responds to needs and involves the community in various stages, the results must be accountable.

Because the goal involves the expected conditions, then by itself, goal setting becomes a very important momentum. If a series of steps is intended for the benefit of the people, then there must be people's involvement (in the sense of conscious involvement). Without the involvement of the people, it is very possible that the

formulation issued contains the influence of external character. Therefore, it must be realized that the basic needs of the community will be very different from those of outsiders, because each community has different needs. Every effort to homogenize will mean the denial of plurality and at the same time the neglect of the essence of the people's needs.

#### **e. Define the Steps in Detail**

Determination of steps is the process of arranging what will be done. Actually this process is a process of making a more complete formulation, planning in an action plan. Generally, an action plan will contain (1) what will be achieved, (2) the activities to be carried out, (3) the division of tasks or division of responsibilities (who is responsible for what), and (4) time (when and how long the activities will be carried out). will be done). To develop better steps, it is necessary to clarify the formulation by using firm statements and not giving rise to different interpretations.

#### **f. Planning a Budget**

Budget planning here does not mean counting money, but rather an attempt to arrange budget allocations or available resources. The preparation of this budget will determine the success or failure of a plan. Mistakes in preparing the allocation, will make a plan aground in the middle of the road. Budget can also be meaningful as a means of control.

### **3. METHOD**

The method used in this study is a qualitative research method, with a case study approach with 41 informants with the types of qualitative data and quantitative data while the data sources in this study came from primary data sources and secondary data while the data collection method in this study was research Field Research ( Field Research ), Library ( Library Research ) while the Data Collection Techniques in this study are observation, qualitative interviews and qualitative documents.

In analyzing the data, the data obtained by the researcher used the data analysis technique proposed by Bungin (2012:70), which is as follows:

#### **1. Data Collection ( Data Collection )**

Data collection is an integral part of data analysis activities. Data collection activities in this study were using interviews and documentation studies.

#### **2. Data Reduction ( Data Reduction )**

Data reduction is defined as the selection process, focusing on simplification and transformation of rough data that emerges from written notes in the field. Reduction is carried out since data collection begins by making summaries, coding, tracing themes, making clusters, writing memos and so on with the aim of eliminating irrelevant data/information.

#### **3. Data Display**

Display data is a description of a set of structured information that provides the possibility of drawing conclusions and taking action. The presentation of qualitative data is presented in the form of narrative text. The presentation can also be in the form of matrices, diagrams, tables and charts.

#### **4. Verification and Confirmation of Conclusions (Conclusion Drawing and Verification )**

Is the final activity of data analysis. Drawing conclusions in the form of interpretation activities, namely finding the meaning of the data that has been presented.

### **4. RESEARCH RESULTS AND DISCUSSION**

#### **4. 1 Participatory Planning Steps in the Preparation of the Malacca District Medium Term Development Plan**

The Regional Medium-Term Development Plan (RPJMD) is a regional planning document for a period of 5 years starting from being inaugurated until the end of the regional head's term of office and to be able to produce a participatory planning document in the regional development planning of the Malacca Regency, the Malacca Regency Government needs to take the following steps. planned, directed and focused. So in this case the Regional Development Planning Agency for Research and Development (Bappeda) of Malacca Regency as the object of research that functions as the "kitchen" of regional government development planning must design steps to produce the participatory planning document.

Talking about participatory planning, of course, cannot be separated from a forum used to organize participatory development planning, namely the Public Consultation Forum and the Development Planning Deliberative Forum (Musrenbang). Participatory planning in the preparation of the Regional Medium-Term Development

Plan is mental involvement or thoughts and emotions, contributions from the community and development stakeholders in the preparation of the Regional Medium-Term Development Plan document with the aim of obtaining aspirations and creating a sense of belonging by involving members of the Regional Legislative Council (DPRD) Dapil . Local, Regional Apparatus , Camat , Village Head, elements of community members as well as NGOs and other related institutions within the Malacca Regency area.

This participatory approach in the preparation of development planning is also emphasized in Law Number 23 of 2014 concerning Regional Government which in article 261 paragraph (3) which states that a participatory approach is carried out by involving various stakeholders, then to prepare the Regional Medium-Term Development Plan (RPJMD). ) that is participatory, it is necessary to hold a Development Planning Deliberation (Musrenbang) for the preparation of the RPJMD. As stated in the Minister of Home Affairs Regulation Number 86 of 2017 concerning Procedures for Planning, Controlling and Evaluation of Regional Development, Procedures for Evaluation of Draft Regional Regulations concerning Regional Long-Term Development Plans and Regional Medium-Term Development Plans, and Procedures for Amending Long-Term Development Plans Regions, Regional Medium-Term Development Plans, and Regional Government Work Plans that the Development Planning Deliberation, hereinafter referred to as Musrenbang, is a forum between stakeholders in the context of preparing regional development plans.

Therefore, to analyze participatory planning in the preparation of the Malacca District Medium-Term Development Plan, the researcher uses the opinion of Abe (2002:71) which states that planning steps are prepared from the bottom ( bottom up ) and not from planning on the initiative of the local government. .

There are several steps that must be taken to optimize the absorption of community aspirations using a participatory planning approach according to Abe (2002:71), namely; (1) Investigation, (2) Formulation of the problem, (3) Identification of carrying capacity, (4) Formulation of objectives, (5) Establishing detailed steps and (6) Designing a budget with the results of research and discussion as follows:

### **1. Investigation**

Abe (2002:71) states that investigation is a process to find out, explore, and collect local problems in the Malacca Regency area that are developing in the community. The research here is not an academic activity, but an activity that is part of the change effort. In this process, community involvement is a non-negotiable key factor. Thus, the investigation process is a process of inviting the community to carefully identify the problems they face.

Based on the results of the interview, it is known that the stages of investigation in participatory planning for the preparation of the Malacca District Medium-Term Development Plan refer to the Minister of Home Affairs Regulation Number 86 of 2017 consisting of Preparation Preparation, Preparation of Initial Designs, Implementation of Public Consultations, Drafting, Implementation of Musrenbang , Final Draft Formulation, Determination.

The implementation of the Public Consultation Forum aims to obtain input on the Preliminary Draft of the RPJMD which includes:

1. Refinement of the Technocratic Design;
2. Elaboration of KDH's Vision and Mission;
3. Formulation of Goals and Objectives;
4. Strategy Formulation and Policy Direction;
5. Formulation of Regional Development Programs;
6. Regional Apparatus Program Formulation;
7. SEA.

The implementation of the Public Consultation Forum is coordinated by Bappeda by involving Regency/City Apparatus and Stakeholders (Community Elements). With the involvement of the Regional Apparatus and the Community in this activity, it is hoped that there will be a discussion between the Community and the Regional Apparatus to obtain input on the Initial RPJMD Draft, especially regarding the Formulation of the Regional Development Program and the Formulation of the Regional Apparatus Program . The results of the discussion on regional development programs and Regional Apparatus Programs are stated in the Minutes of Agreement signed by elements representing stakeholders.

Based on the minutes, the Initial RPJMD Draft was revised. With the completion of the Preliminary Draft of the RPJMD, it will become the basis for the refinement of the Preliminary Draft of the Regional Apparatus Strategic Plan. At this stage, the community is invited to provide input on the Initial RPJMD Draft in the form of suggestions to Bappeda and related Regional Apparatuses regarding the handling of problems faced and needed to handle them with budget allocations sourced from the APBD.

Community involvement in the two stages mentioned above is being present or involved in submitting suggestions and ensuring that these suggestions are accommodated in the RPJMD which is then outlined in the Regional Strategic Plan.

However, at this stage of the investigation, the previous period's RPJMD public consultation was only carried out 1 (one) time and did not involve the people of the Malacca Regency, so that the participants who attended consisted only of Bappeda/Development Team with Regional Apparatus. Meanwhile, in the implementation of the RPJMD public consultation for the current period, it was carried out in 3 (three) zones for 12 sub-districts which were divided based on the electoral district by involving Regional Apparatus, DPRD Members and community representatives. However, the results of the discussions at the public consultation forum were not stated in the minutes of the collective agreement as the basis for improving the initial draft. This condition is due to the lack of understanding of the apparatus/employees at Bappeda regarding the stages and procedures for compiling the RPJMD document as mandated in the Minister of Home Affairs Regulation Number 86 of 2017.

## **2. Problem Formulation**

For Abe (2002:71) the formulation of the problem is an advanced stage of the results of the investigation of local problems in the Malacca Regency. The data or information that has been collected is then processed in such a way that a more complete, complete, and in-depth picture is obtained.

Based on the results of interviews and observations made by the author, it is known that in the stage of preparing the RPJMD document, the participation of the community is not optimal where some participants only attend and do not provide suggestions during the activity. In addition, the results of the collective agreement were not re-informed to the participants in attendance. In addition, the process of analyzing information related to the problems faced had been adjusted to the vision, mission and priority programs of the regional head, but only based on what was conveyed by the Regional Apparatus, not what was conveyed by the community, while according to Abe (2002:71) that for To reach the formulation, basically an analysis process is carried out on information, data and people's life experiences. The analysis process itself is meaningful as an action to find a connection between one fact and another. What is formulated must be simple, clear and concrete. In order for the formulation of the problem to reflect the needs of the community (community), there is no other way but to involve the community in the process and according to the findings of researchers in Malacca District, this was not done.

Stakeholders should strive so that the input data collected is truly what is felt and what is the concern of the community (Ketaren, 2009:48). In this case, not all what is conveyed by the community must be accepted, it is precisely at that time that the momentum for the community together chooses which aspects are needs and which are just wants. A desire, of course, has a high degree of subjectivity, and tends to have no clear boundaries. Therefore, what will be a priority is to answer the basic needs of the community (Nurcholis, 2008:11) and not based solely on the opinion of the OPD and the Camat in Malacca Regency.

Community in the context of development is the main element, therefore participation of society is the most basic thing that must be absorbed so that the development carried out becomes more meaningful and purposeful. Without community participation, development will have double meaning: first, as a means of elite deception to the community and secondly, as an embodiment of fake democracy, because development is nothing more as mere ideas and interests of the elite.

## **3. Identification of Carrying Capacity**

In this case, carrying capacity is not defined as concrete funds (money), but all aspects that can enable the implementation of activities in achieving the goals and targets that have been set.

The carrying capacity of the problems faced should be sourced from available local wisdom resources and other resources. However, without the involvement of the community, the resources available to the community cannot be mapped, while the carrying capacity is very dependent on (1) the problems faced, (2) the goals to be achieved, and (3) the activities to be carried out (Abe, 2002:71). ) and if the community is not involved in the process of formulating the Malacca District RPJMD, as the researchers found, the identification of the carrying capacity only accommodates the interests of certain groups.



Clarity about these aspects will basically be very helpful in understanding what the people of Malacca Regency have. An understanding of effective carrying capacity by involving the community in Malacca Regency is needed so that the work plans that are prepared are not arbitrary, but really are the result of accurate calculations (Aija et al, 2020) because participatory planning thinking begins with the awareness that performance a community development initiative is very much determined by all parties related to the initiative ( Davidoff, et al, 2005:19) so that collaboration between the community and public officials is very important if we are to enforce participatory planning as a model of efficient governance (Saša and Jani, 2020 ) and provide services according to the demands of the community (Pranab, 2020) in Malacca Regency.

#### **4. Goal Formulation**

A goal is a condition to be achieved, a desired state (expected), and therefore a number of efforts are made to achieve it. To produce an effective development program, the conditions are transparent, responsive, participatory, accountable (Abe, 2002:71).

at the stage of goal formulation it is not transparent, responsive, participatory, accountable even in findings based on the observations of researchers that since the RPJMD was set for 2021-2026 there has never been an annual evaluation of the achievements of the RPJMD including the budget. The evaluation was only carried out manually only because there were regulatory demands for the completeness of the RPJMD document for the next period, so an evaluation had to be carried out.

According to Abe (2002:71) that; (a) transparency is a decision-making process and mechanism that has been built since starting at the kelurahan level it is known and can be monitored by the community but does not occur in the participatory planning process for the preparation of the Malacca District Medium Term Development Plan. because the design was from certain parties but what happened was that the RPJMD draft did not respond to issues in the community and only involved public officials and furthermore (c) participatory where community involvement became a necessity in the sense that the formulation was carried out together and always paid attention to problems/issues raised by the community but not carried out and must be (d) accountable as long as the entire planning process needs to be carried out transparently, responds to needs and involves the community in various stages, the results must be accountable but since The RPJMD has been set for 2021-2026. There has never been an evaluation of the achievements of the RPJMD every year, including the budget.

An evaluation should be carried out every year so that based on the evaluation results it can be seen that there are targets that are set too high and cannot be achieved or targets that have been set in stages but have been implemented as well as become the basis for the revision of the RPJMD to be adjusted because the objectives involve the expected conditions. the goal becomes a very important momentum in participatory planning in the preparation of the Malacca District Medium Term Development Plan. If a series of steps is intended for the benefit of the people, then there must be people's involvement (in the sense of conscious involvement).

Without the involvement of the people, it is very possible that the formulation issued contains the influence of external character. Therefore, it must be realized that the basic needs of the community will be very different from those of outsiders, because each community has different needs. Every effort to uniformity will mean the denial of plurality and at the same time ignoring the essence of the people's needs (Dror in Hadi, 2005) .

#### **5. Define Detailed Steps**

Determination of the steps is the process of compiling what will be done to advance the Malacca Regency Region. Actually this process is a process of making a more complete formulation, planning in an action plan. Generally, an action plan will contain (1) what will be achieved, (2) the activities to be carried out, (3) the division of tasks or division of responsibilities (who is responsible for what), and (4) time (when and how long the activities will be carried out). will be done). To develop better steps , it is necessary to clarify the formulation by using firm statements and not giving rise to different interpretations (Abe, 2002:71).

In the process of determining the steps of the Malacca District RPJMD for 2021-2026 in detail it has contained (1) what will be achieved but not what the people of Malacca want to achieve but public officials or what according to Aulia (2020) is a power struggle between stakeholders. interests of (2) activities to be carried out but are constrained by (3) division of tasks or division of responsibilities (who is responsible for what), and (4) time (when and how long the activities will be carried out) so that these findings are in line with the findings (Nurman , 202 1) where the formulation and determination of development priorities are not synchronized and do not complement each other.

Abe (2005:32) who emphasized that regional planning is a way to strengthen community initiatives. Abe's idea is certainly parallel to his previous argument which states that regional autonomy also means a vehicle for strengthening local institutions. Strong local institutions certainly become the basis for community initiatives and participation so that the determination of steps is a process of compiling what will be done to advance the Malacca District and ideally should involve community participation because participatory planning thinking begins with the awareness that the performance of a community development initiative is very important. determined by all parties involved in the initiative.

#### **6. Planning a Budget**

Budget planning here does not mean counting money, but rather an attempt to arrange budget allocations or available resources. The preparation of this budget will determine the success or failure of participatory planning in the preparation of the Malacca District Medium Term Development Plan. Mistakes in preparing the allocation, will make a plan aground in the middle of the road.

The results of the study found that in the budget planning stage, in the preparation of the RPJMD, namely the preparation of Income and Expenditure Projections and the Funding Framework. Revenue projections are calculated based on the average growth of each object of income, whether sourced from Regional Original Income, Transfer Income or Other Legitimate Income. Meanwhile, the projected expenditures, taking into account the availability of the budget in the projected income, are first allocated for mandatory costs, namely Salary and Allowance Expenditures, after which they are allocated for regional development expenditures.

This allocation for development expenditure needs special attention, especially to increase community participation in development starting from planning, implementation and supervision, but it was found that often budget proposals were accepted by the community in the public consultation stage but after that there was uncertainty in the budgeting or financing of community proposals. while the preparation of this budget will determine the success or failure of participatory planning in the preparation of the Malacca District Medium Term Development Plan. Mistakes in preparing the allocation, will make a plan aground in the middle of the road.

In the findings of the researcher, it is known that there is a budget design that is not synergistic, causing development in Malacca Regency to be ineffective and inefficient. The development costs are high and the benefits are not optimal because there is overlapping and duplication of programs in one location that should only be carried out by one agency. In fact, the resources (budget) should be used for programs in other locations in Malacca Regency.

Definitively, the concept of participation contains two meanings, participation at the level of ideas and participation at the level of structural roles. At the idea level, the concept of participation means a number of verbal ideas from any level of society. At the role level in the structure, it is direct involvement in an activity (Amiruddin, 2003: 3) and when referring to Law no. 25 of 2004 concerning the National Development Planning System and Law no. 17 of 2003 which regulates State and Regional Financial Management, Law no. 23 of 2014 regulates planning and budgeting in the regions, it is clearly and unequivocally stated that the people have the right to participate in the preparation and return of budget decisions.

#### **5. CONCLUSION**

The participatory planning steps in the preparation of the Medium Term Development Plan for the Malacca Regency 2021-2026 use the opinion of Abe (2002:71) with the conclusion that the participatory planning steps in the Malacca Regency are not prepared from the bottom ( bottom up ) but are planning on the initiative of the government area so that at the stage of investigation, problem formulation, identification of carrying capacity, formulation of objectives, setting detailed steps and designing a budget, it does not fully involve community participation which in the end has an impact on the proposed activity not really in accordance with what is desired and becomes a community needs.

## MANAGEMENT OF PERFORMANCE TARGETS OF HEAD OF PERFORMANCE AT THE DEPARTMENT OF EDUCATION AND CULTURE OF MALACA REGENCY

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### ABSTRACT

*The increase in the amount of village fund receipts, while there were no significant changes in answering the problems of the South Mataru village community, even found some findings that caused problems in the management of village funds.*

*The type of research used in this study is a case study, while the informants in this study will be selected purposively and will be selected using the snow-ball technique . In analyzing the data, the author uses the analysis model of Miles and Huberman (1992:16) that qualitative data analysis is carried out interactively and takes place continuously until complete, so that the data becomes saturated. Activities in data analysis, namely data reduction ( data reduction ), data display ( data display ) and verification/conclusion ( Verification/conclusion drawing ).*

*The results of the study found that; ( 1) at the planning stage of the 4 documents that must be available, two of them are available and two of them are not available so that the authors conclude that they are less accountable, (2) at the implementation stage in the village of South Mataru, namely the completeness of the expenditure and receipt documents carried out through the village treasury account. , Bank sub-book documents as evidence showing the village treasurer keeping money in the village treasury. Administrative completeness such as documents for procurement of goods and services as well as details of the 2020 RAB for the use of fees are not available. Thus, the authors conclude that the implementation stage can still be accounted for or accountable, (3) at the administrative stage it is known that from a number of administrative completeness only report documents to the village head every month are not available so the authors say they can still be accounted for or accountable and at stage (4) reporting can be declared accountable or accountable.*

*Keywords: Accountability, Village, Fund*

### 1. INTRODUCTION

The government enacted Law No. 6 of 2014 concerning the Village on January 15th . In the preamble to the Law, it is stated that the Village has the right of origin as well as traditional rights in regulating and managing the interests of the local community and even plays a role in realizing the ideals of independence based on the 1945 Constitution of the Republic of **Indonesia**. It is hoped that it will bring about important changes aimed at improving services to the community and improving the welfare and empowerment of rural communities.

. One form of government concern for the success of village government administration is the existence of a special development budget that is included in the Village Revenue and Expenditure Budget (APBDes) in the form of Village Fund allocation which is included in the village income transfer group. The Village Fund management process must be based on the Principles of Transparency, Accountability and Participation. In managing the Village Fund, it is required to have an aspect of good **governance** , one of which is Accountability. The village head and other village officials must be transparent and responsible in managing village finances starting from planning, implementation, administration, reporting and accountability. The principle of accountability must be applied by the village government in its governance, where all final activities can be accounted for by the village community in accordance with applicable regulations. So that an understanding of the financial management of village funds is needed as a medium for transparency and delivery of accountability for the use and implementation of activities funded by village funds.

City APBD and are prioritized for the implementation of development and empowerment of rural communities. The aim is to improve village public services, alleviate poverty , advance the village economy, overcome development gaps between villages and strengthen village communities as development subjects. Therefore, village funds are calculated based on the number of villages and allocated based on the population, poverty rate, area and geographical difficulty level.

In the district of Alor , there are 158 ( one hundred fifty in eight ) in 2015 in \_\_\_\_\_ ti a pt a hun n y a m e n e r i m a l o k a s i d a n a d e s a d a r i p u s a t . One of my 158 villages is included in the list of village fund receipts. The following is the amount of village fund receipts in the village of South Mataru since 2015–2020;

**Table 1.1** Total Village Funds in South Mataru Village 2015–2020

Fiscal year	Total Village Fund (Rp)	Increase / Decrease (Rp)	Percentage Change (%)
2015	547,311,425.00	0	100
2016	602,252,430.52	54,941,005.52	9.12
2017	768,698,138.00	166,445,707.48	21.65
2018	928,634,000.00	159,935,862.00	17.22
2019	1,116,946,000.00	188,312,000.00	16.86
2020	1,111,056,000.00	-5,890,000.00	0.53
Amount	5,074,897,993.52	563,753,575.00	

*Source;* South Mataru Village APBDes 2015-2020

South Mataru Village in 2015 to 19 the total budget has continued to increase , in 2020 revenue has decreased from 2019 amounting to Rp. 5,890,000.00 or 0.53% due to there is a refocusing as a result of the outbreak of the covid 19 virus .

Regarding the implementation of Village Fund management in South Mataru Village, it was found that administratively the management of Village Funds in South Mataru Village always experienced delays in reporting and accountability for the use of village funds. This delay resulted in a delay in the distribution of the next stage of Village Funds and ultimately affected the implementation of each program.

Based on the results of the examination by the Alor district inspectorate stated that;

### **1. Village Government Implementation Report is Not Made**

With reference to the results of the examination of the administration of village governance, it was found that the Head of the South Mataru Village was in the late 1960s. Nikolaus Maipada did not make a TA Village Administration Report. 2016 to 2020 and have not submitted it to the Alor Regent, BPD and the community of South Mataru village. This is due to the Head of South Mataru Village in the late 1960s. Nikolaus Maipada was negligent in carrying out his obligations in accordance with the provisions of Law Number 6 of 2014. As a result, information about the implementation of government administration in South Mataru Village during the FY. 2016 to 2020 become limited and unknown to stakeholders and the community of South Mataru village.

### **2. The Description of the Duties and Authorities of the Village Apparatus Has Not Been Made**

The results of the examination of the Head of the South Mataru Village on the implementation of the main tasks and functions show that the Village Head as the Head of the Village Government who leads the implementation of the Village Government has not made a description of the duties and functions of the village apparatus.

### **3. Inadequate Village Administration**

This is because the Village Secretary does not carry out administrative functions . As a result, the village administration book which records all data and information regarding the implementation of government activities in the village of South Mataru is not available. Recommended to the Head of South Mataru Village ordered the Village Secretary to work on the administration of the village of South Mataru.

### **4. Village Original Income (PADES) Was Not Realized/Did Not Reach the Target.**

Based on the Revenue and Expenditure Budget of South Mataru Village TA. In 2016 , it is known that the South Mataru Village Government has budgeted revenue from Village Original Income (PADES) which will be used for goods and services shopping activities in Mataru village in the amount of Rp. 5,000,000.00 .

above , it shows that there has been an increase in the amount of village fund receipts , while there are no significant changes in answering the problems of the South Mataru village community and even some findings that cause problems in the management of village funds. Therefore , the authors feel interested in conducting research to dig further at the empirical level , wanting to research how “**Management of Performance Targets of Head of Performance At the Department of Education and Culture of Malaca Regency**”.

## **2. LITERATURE REVIEW**

### **a. Accountability**

Accountability is one of the prerequisites for the implementation of good governance . Accountability which is the main principle of the implementation of good governance is one of the government's references in the implementation of public services as stated by Sedarmayanti (2003: 69) that:

Accountability can be stated as an obligation to provide accountability or answer and explain the performance and actions of a person or an organization to parties who have the right or authority to ask for information or accountability. "

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The existence of such accountability is a form of transparency of the activities carried out

In Article 3 of the Law of the Republic of Indonesia Number 28 of 1999 concerning the Implementation of a Clean and Free State from Corruption, Collusion and Nepotism, it is stated that accountability is one part of the general principles of state administration. The principle of accountability in the law means that accountability is the principle that determines that each and the final result of state administration activities must be accountable to the community or the people as the holder of the highest sovereignty of the state in accordance with the provisions of the applicable laws and regulations.

Mulgar and Uhnur in Raba (2006:14), accountability is a concept related to governance activities—that is, with efforts to establish and maintain forms of governance in a social context. Accountability as a form of accountability for all government actions, is not only limited to providing transparent performance reports but needs to consider aspects of values in society as stated by Kumorotomo (2013: 4) that:

"Accountability is a measure of whether government activities or services are in accordance with the norms and values adopted by the community and whether these public services are able to accommodate the real needs of the people."

Turner and Hulme quoted by Surjadi (2009:128) state that accountability also implies the provision of information and disclosure of government financial activities and performance to parties with an interest in the report. The government must be able to become the subject of providing information in the context of fulfilling the rights of the public. The demand for public accountability requires public sector institutions to place more emphasis on horizontal accountability, not just vertical accountability. Romzek and Dubnick in (Raba 2006:22) suggest that:

"More broadly conceived public administration accountability involves the means by which public agencies within and outside the organization".

That the accountability of public administration in a broad sense involves public institutions ( agencies ) and bureaucrats ( their workers ) to control various expectations that come from within and outside the organization. Thus, the accountability of public administration is actually related to how the public bureaucracy ( agencies ) realizes public expectations.

Based on several accountability concepts that have been stated, it shows that accountability is an important aspect that is implemented in order to realize Good Governance . This shows that accountability is broader than the scope of responsibility outside the government alone. Accountability includes the obligation to report the success or failure of achieving the organization's mission and managing existing resources. This means that all government actions must obtain public scrutiny.

### **b. Management**

In the complete Indonesian dictionary (Daryanto, 1997:348) it is stated that management is a process or method of managing or the process of carrying out certain activities by mobilizing the power of other people, processes that help formulate policies and organizational goals or processes that provide supervision on all things involved. in implementing policies and achieving goals.

Management comes from the word manage, in the Big Indonesian Contemporary Dictionary essay means to lead, control, regulate, and strive to be better, more advanced and in part and be responsible for certain jobs. Management is a process that helps formulate policies and objectives providing oversight on all matters involved in the implementation and achievement of goals (Salim and Salim, 2002:534).

According to Handyaningrat (1997:9) management can also be defined as the organization of an activity. Management can be interpreted as management, which is a process of activities starting from planning, organizing, directing and supervising the efforts of members of the organization and the use of other organizational resources in order to achieve predetermined organizational goals.

Handoko and Basu (1997:8) state that management is a process that helps formulate a policy and organizational goals or a process that provides oversight to someone involved in the implementation and achievement of goals. It can be concluded from some of the opinions above that management is an activity that starts from planning, organizing, directing and supervising all things involved in implementing and achieving goals.

According to Arikunta (1988:8) management is a substantive of managing, while managing means an action that starts from compiling data, planning, organizing, implementing, to monitoring and evaluating. It is explained later that management produces something and that something can be a source of refinement and improvement of further management.

So it can be concluded that management (management) is a method or process that starts from planning, organizing, monitoring and evaluating to achieve a predetermined goal in order to run effectively and efficiently.

### **c. Village**

General understanding is an understanding that is widely used by the public in general about the nature or definition of a particular object being discussed. In general, the village is interpreted by the community as a place to live for a group of people which is characterized by the use of grammar with a strong regional accent, a relatively low level of education, and generally the community members make a living in the agricultural or marine sector. In the General Indonesian Dictionary, it is stated that a village is (1) an area inhabited by a number of families that have their own system of government (headed by a village head), (2) a group of houses outside the city which is a unitary village, hamlet, (3) udik or hamlet ( in the sense of the interior or the opposite of the city), (4) place, land, area (Poerwadarminta, 2007: 286).

Villages based on the provisions of Article 1 point 1 of Law Number 6 of 2014 concerning Villages are defined as traditional villages and villages or what are called by other names, hereinafter referred to as villages, are legal community units that have territorial boundaries that are authorized to regulate and manage government affairs, the interests of the local community based on community initiatives, origin rights, and/or traditional rights that are recognized and respected in the government system of the Unitary State of the Republic of Indonesia.

Kartohadikoesoemo (1984:280) states that the village is a legal entity where a ruling community resides and the community holds its own government. Meanwhile, the definition of village according to Ndaha (1981:33) is the lowest unit of government organization, has certain territorial boundaries, is directly under the sub-district, and is a legal community unit that has the right to organize its household.

Handono (2005:132) states that the village is always associated with two main images, namely: (1) the village is sociologically seen as a community in a certain geographical unit which they know each other well with a relatively homogeneous life style and many depend directly on the community. nature, so that most of the people are still very dependent on nature, and (2) villages are often identified with power organizations. Through this lens, the village is understood as a power organization that politically has certain authority in the structure of the state government.

The village is one of the autonomous regions that is at the lowest level of the regional autonomy hierarchy in Indonesia, as stated by Nurcholis that, "the village is the lowest government unit". One form of village government affairs that is under the authority of the village is village financial management. Village finances are all village rights and obligations that can be valued in money, as well as everything in the form of money or goods that can be used as village property in connection with the implementation of rights and obligations (Hanif, 2011:81).

Sukriono (2008:1) expressed his opinion that the lowest government unit in the State of Indonesia is the village. The concept of the village as a social entity is very diverse, namely according to the intent and point of view that will be used in viewing the village. The term village can be a concept without political meaning, but it can also mean a political position and at the same time the quality of the position in front of other parties or forces.

According to Government Regulation Number 43 of 2014 concerning Implementing Regulations of Law Number 6 of 2014 concerning Villages, the village government consists of the village government and village consultative bodies. The village government consists of the village head and village officials. The village head has the task of carrying out government, development and community affairs.

Sukriono (2010: 189) defines village government as village heads and village officials as elements of village administration. This formulation is different from the Law of the Republic of Indonesia Number 5 of 1979 which states that the village government consists of the village head and LMD. LMD is a kind of village representative body. However, because the LMD is led by the village head, its position, role, function, and main duties are not clear as an institution with legislative or executive functions. The Law of the Republic of Indonesia Number 22 of 1999 clearly distinguishes the roles of the village head and the BPD. The village head is the policy implementer, while the BPD is the policy-making and supervisory agency (village regulations). So, the BPD is a body like a small DPRD in the village

Article 18 of Law Number 6 of 2014 concerning Villages explains that village authority includes authority in the field of village administration, implementation of village development, village community development, and village community empowerment based on community initiatives, origin rights, and village customs. Furthermore, Article 19 explains "Village authorities include: authority based on origin rights; village-scale

local authority; authority assigned by the government, provincial regional government, or district/city regional government". The implementation of authority based on the right of origin and local authority on a village scale as regulated and managed by the village. The implementation of the assigned authority and the implementation of other task authorities from the government, provincial regional government, or district/city regional government are managed by the village.

The authorities possessed by the village encourage the village to be more independent, creative and innovative in an effort to improve the welfare of its community, namely by generating initiatives and potentials of existing resources. In carrying out the wheels of government, the village is obliged to be able to improve development, public services and implement village financial management in a good, transparent, and accountable manner.

### **3. METHOD**

The type of research used in this research is a case study. In selecting informants, researchers are expected to be able to see the abilities of the informants, so that the research objectives to be achieved can be answered. Informants in this study will be selected purposively, namely the determination of informants based on certain considerations, namely knowing enough about the local government's innovation program in education affairs and will be selected using the snow-ball technique. In analyzing the data, the author uses the Miles and Huberman analysis model. This analysis model is proposed by Miles and Huberman (1992:16) that qualitative data analysis is carried out interactively and takes place continuously until complete, so that the data becomes saturated. Activities in data analysis, namely data reduction ( data reduction ), data display ( data display ) and verification/conclusion ( Verification/conclusion drawing ).

### **4. RESEARCH RESULTS AND DISCUSSION**

#### **4. 1 Management of Performance Targets of Head of Performance At the Department of Education and Culture of Malaca Regency.**

Accountability is one of the prerequisites for the implementation of good governance. Accountability which is the main principle of the implementation of good governance is one of the government's references in the implementation of public services as stated by Sedarmayanti (2003: 69) that:

Accountability can be stated as an obligation to provide accountability or answer and explain the performance and actions of a person or an organization to parties who have the right or authority to ask for information or accountability. "

The existence of such accountability is a form of transparency of the activities carried out

In Article 3 of the Law of the Republic of Indonesia Number 28 of 1999 concerning the Implementation of a Clean and Free State from Corruption, Collusion and Nepotism, it is stated that accountability is one part of the general principles of state administration. The principle of accountability in the law means that accountability is the principle that determines that each and the final result of state administration activities must be accountable to the community or the people as the holder of the highest sovereignty of the state in accordance with the provisions of the applicable laws and regulations.

In Permendagri No. 113 of 2014 concerning Village Financial Management, it is stated that the stages of village government financial management include planning, budgeting, implementation, administration, reporting and accountability stages.

In detail, the stages of managing village finances will be described as follows :

#### **1 . Planning Stage**

The main objective of the government program through the allocation of village funds is to improve the conditions and standard of living of the community in the context of national development in order to achieve fair and equitable welfare. The government has a big role in building the country's economy, especially to build the local economy for villagers or villages. In general, there are many programs that have been made by the Indonesian government to improve the living standards of the Indonesian people ( Matridiet al, 2019).

In its implementation, the central government allocates transfer funds to the regions and these funds give villages greater authority and the annual budget, which was ratified through the Village Law Number 6 of 2014 and referred to as village funds (Watts et al, 2019).

At the planning stage, it is carried out transparently and involves the participation of the community in the village. Village Fund planning begins with the Village head as the person in charge of the Village Fund holding a village meeting to discuss the Village Fund program plan, which is attended by elements of the village community, consisting of traditional leaders, religious leaders, community leaders and educational leaders. The

results of the deliberations are set out in the Fund Use Plan (RAP) as one of the ingredients for the preparation of the APBDes. At this stage the village community can access a policy and participate in the decision-making process for planning the use of the Village Fund.

In the implementation of this planning stage, administratively, the village is required to have supporting documents which are physical evidence in the form of documents that show that this stage is actually implemented and can be proven by the records in these documents. In this study, at the planning stage, the administrative accountability sub-focus is on the availability of the Raperdes document on the APBDesa, the availability of the APBDesa document is submitted to the Regent/Mayor through the sub-district head no later than October of the current year, the availability of the APBDesa document is evaluated by the Regent/Mayor for a maximum of 20 working days, and the Village head makes improvements for 7 days if the Raperdes APBDesa is declared inappropriate, and the availability of priority documents for the use of Village Funds is stipulated in village meetings between BPD, Pemdes and Community Elements.

Based on the results of the research conducted, as well as based on the results of interviews, the researchers found that the administrative activities in this planning stage were all running as they should. The parties that must be involved in the planning stage are all involved. Not only attending planning meetings but also being actively involved in making decisions regarding the planned use of the Village Fund budget for the 2020 fiscal year.

Administrative accountability at the planning stage with the availability of several documents that must be available, namely the availability of the Raperdes document on the APBDesa, the availability of the APBDesa document submitted to the Regent/Mayor through the Camat no later than October of the current year; The availability of the APBDesa document is evaluated by the Regent/Mayor for a maximum of 20 working days, and the Village head makes improvements for 7 days if the APBDesa is declared incompatible with the Raperdes; availability of priority documents for the use of Village Funds determined in village meetings between BPD, Pemdes and Community Elements.

Based on the guidelines from the subfocus with the conditions that the researchers found in the field at the planning stage, of the 4 documents that must be available the village can only show evidence of the APBDesa document submitted to the Regent/Mayor through the Camat no later than October of the current year while the other 3 documents are not available.

community prioritizes the use of the Village Fund which is determined in the village meeting between the BPD, Pemdes and Community Elements, but the results of this priority agreement are not made in the form of a document. This is because the village head and village officials do not know that they must include it in the form of a document. So far this has never been done.

Based on these conditions, the researchers concluded that the administration at the planning stage is said to be accountable. Because all documents are available. Even though one of the documents, namely the priority document for the use of the Village Fund, which is determined in the regional deliberation between the BPD, Pemdes and Community Elements, is not made in the form of a document, but in its implementation it is carried out based on a priority scale.

## **2. Implementation**

The implementation phase is carried out in a transparent and accountable manner. The implementation of activities in the APBDes whose funding is sourced from the Village Fund is fully carried out by the Village Implementing Team, then to support the disclosure and delivery of information to the public, every implementation of the Village Fund's physical activities must be equipped with an Activity Information Board installed at the activity location. The Village Implementation Team has an obligation to account for its performance during the implementation of Village Fund activities.

Turner and Hulme quoted by Surjadi (2009:128) state that accountability also implies the provision of information and disclosure of government financial activities and performance to parties with an interest in the report. The government must be able to become the subject of providing information in the context of fulfilling the rights of the public. The demand for public accountability requires public sector institutions to place more emphasis on horizontal accountability, not just vertical accountability. Romzek and Dubnick in (Raba 2006:22) suggest that:

“More broadly conceived public administration accountability involves the means by which public agencies within and outside the organization”.



In the implementation stage of village fund management, a Goods/Services Procurement Activity Management Team is formed, **hereinafter referred to as TPK, is a team determined by the Village Head with a Decree, consisting of elements of the Village Government and Elements of Village Community Institutions to carry out the procurement of goods/services.**

Based on the Juklak Bimkom Village Financial Management (2015), the implementation of village finances is based on the principle of village revenues and expenditures, namely through the Village Cash Account. Each receipt and expenditure must be supported by valid and complete evidence. In this case, it is contained in the form of documents which are divided into expenditure and receipt documents which are carried out through the Village Treasury account or according to the provisions of the Regency/City government; Documents for the procurement of goods and or services in the Village based on the Regent's Regulation; document detailing the RAB for the use of incidental costs and legalized by the village head. In the various stages of implementing the Village Fund management, there may be no levies other than those stipulated in the village regulation and the treasurer can keep the money in the Village Treasury and the amount is determined by the Perbup/Mayor.

The results showed that the administration at the stage of implementing Village Fund management in Mataru Selatan Village was not accountable. This is evidenced by the results of the examination of the village head of South Mataru on the implementation of the main tasks and functions by the Regional Inspectorate of Alor Regency which shows that the Village Head as the Head of the Village Government who leads the administration of village administration has not made a description of the duties and functions of the village apparatus.

The village apparatus as referred to is the Village Secretary, regional executor; and technical implementers. One of the duties of the village secretary is to carry out financial affairs such as managing financial administration, administering income sources for the Village Head, Village Apparatus, BPD and other village government institutions. Each affair is led by the head of affairs.

The administration of village fund management at the implementation stage can be concluded by the author that it is carried out in an accountable manner. The results of field observations found that among the 5 administrative documents that must be available, only 1 was not available, while other documents such as expenditure and revenue documents were carried out through the village treasury account according to the district government's stipulation; proof of depositing money in the village treasury stipulated by the Perbup; and documents for the procurement of goods and or services in the village based on bupari regulations. The document that is not available is the RAB Details document for the use of unexpected costs and is approved by the Village Head.

It takes morals, values, attitudes from government officials who are responsible for managing public funds. If an individual commits to certain goals, then this will affect his actions and affect the consequences of his performance (Suartana, 2010: 181). Therefore, village government readiness is needed in implementation of financial management in the village.

Public administration accountability in a broad sense involves public institutions (agencies) and bureaucrats (their workers) to control the various expectations that come from within and outside the organization. Thus, the accountability of public administration is actually related to how the public bureaucracy (agencies) realizes public expectations.

### 3. Administration Stage

The administration stage is carried out in an accountable manner. Administration is an activity specifically carried out by the Village Treasurer. The Village Treasurer is required to record receipts and expenditures as well as open and close every end of the month in an orderly manner, and can account for money through an accountability report. The Village Treasurer keeps a systematic and chronological record of the financial transactions that occur. Administration is carried out using the General Cash Book, Tax Assistant Cash Book, and Bank Books (Juklak Bimkon Village Financial Management 2015).

The Village Treasurer shall record all receipts and disbursements in the General Cash Book for cash. Meanwhile, receipt and disbursement transactions through bank/transfer are recorded in the Bank Book. The Tax Assistant Cash Book is used by the Village Treasurer to record expenses in the form of tax deposits to the State treasury. Specifically for income and financing, there are supporting books in the form of a Book of Income Details and a Book of Details of Financing. In accordance with article 35 of the Minister of Home Affairs No. 113 of 2014 concerning Village Financial Management.

The village treasurer is obliged to account for money through an accountability report. The accountability report is submitted every month no later than the 10th of the following month to the village head. Previously, the village treasurer closed the books at the end of each month in an orderly manner, including the General Cash Book, Tax Book and Income Details Book. The closing of this book was carried out together with the Village Head.

From the research results, researchers only found administrative documents in the form of a General Cash Book (BKU), a Tax Assistant Cash Book, and a Book of Income Details and Financing Details. Meanwhile, other administrative matters such as making accountability report documents submitted monthly to the village head, closing the books at the end of each month (BKU, BP and Income Details Book) which were carried out together with the Village Head were not made. Reports are only carried out simultaneously with village accountability reporting activities.

Based on the results of the research through documentary evidence and interview results, the author concludes that administrative accountability at the administrative stage cannot be fully accounted for or less accountable because of the five administrative points that must exist, only two can be physically accounted for through the availability of documents. Villages cannot account for tutu activities at the end of each month with the availability of documents as physical evidence. The village head also said that the treasurer prepares and submits a report every month to the village head no later than the 10th of the following month but no documentary evidence of the report was found.

The statement based on the findings of the author's research is in line with the results of the analysis of Dekeng and Devi (2020) which shows that management commitment has a significant effect on accountability and transparency and regulation has a significant effect on transparency. Transparency in this case is that all resources and revenues from audit operations are calculated and collected appropriately in Mataru Selatan Village and this is an important part in realizing good governance.

#### **4. Accountability Stage**

In line with this, Kumorotomo (2013: 4) states that accountability is a measure of whether government activities or services carried out are in accordance with the norms and values adopted by the community and whether the public service is able to accommodate the real needs of the people, while Romzek and Dubnick (Raba 2006:22) suggests that; "More broadly conceived public administration accountability involves the means by which public agencies within and outside the organization. That the accountability of public administration in a broad sense involves public institutions ( agencies ) and bureaucrats ( their wokers ) to control various expectations that come from within and outside the organization. Thus, public administration accountability is actually related to how the public bureaucracy ( agencies ) which in this case is the Kelseleon village government realizes public expectations through good and correct accountability of Kelseleon village financial management.

The accountability of the village government as stated by ( Carino, 1993:544) through program accountability is carried out in the administration of government in accordance with the principle of accountability. Mahmudi (2013:9) states that Program Accountability is an evaluation of the goals that have been set can be achieved or not and provide alternative programs that can provide optimal results with minimal costs but in Mataru Selatan Village the program that has been run has not been able to provide optimal results with minimal cost.

The report on the realization of the use of the Village Fund is submitted to the Regent/Mayor every semester, namely for the first semester no later than the fourth week of July of the current budget year and for the second semester no later than the fourth Sunday of January of the following year.

The village head submits an integrated Village Fund accountability report with the accountability of the APBDes implementer in accordance with Permendagri Number 113 of 2014 concerning Village Financial Management. The reports are semi-annual and annual, which are submitted to the Regent/Mayor and some are submitted to the BPD.

The results showed that the village head of Mataru made and submitted a periodic semi-annual and semi-annual Village Fund accountability report, which was submitted to the Regent/Mayor. However, the accountability report submitted by the Head of South Mataru Village is based on a report received from the Regional Inspectorate of Alor Regency that the reports sent are never on time but always experience delays. The accountability report document for the use of the 2020 village fund budget in the village of South Mataru is in the form of several documents that have been attached since the implementation and administration stages. These documents are stored in an application in the form of pdf files so that they can be accessed anytime and anywhere.

Meanwhile, the communication factor is very important to support the success of the accountability of village financial management. In addition, the village government must be able to keep records, or at least keep books of its financial transactions as a form of financial accountability that it does. In addition, the management of village finances requires honesty, objectivity, transparency and accuracy in its management. Village finances are all rights and obligations in the context of administering village government which can be valued in money, including all forms of wealth related to the rights and obligations of the village (Hanif, 2011: 84).

The accountability report to the Regent through the sub-district head which consists of a report on the realization of the implementation of the APBDesa in the first semester and the last semester is submitted by the village that the semiannual report is in the form of a financial report for the next phase of disbursement. Then for the Accountability Report on the realization of the APBDesa implementation which is submitted at the end of the fiscal year which consists of income, expenditure and financing which is determined by a village regulation in the form of several report documents that the author has attached at the planning, implementation and administrative stages.

Meanwhile, punctuality is needed since the planning stage because the clarity of the target partially has a positive and significant effect on performance accountability according to (Surya and Syukriy, 2019). At the planning stage of this village fund, according to Terry (2006:342), it is necessary to select facts and attempt to relate the facts to one another, then make estimates and forecasts about the situation and formulate future actions if needed to achieve the desired results in line with the results. with the management function which is a process of directing and providing work facilities to people who are organized in formal groups to achieve goals (Burhanuddin, 1994:34)

Based on what has been described in above, thus the author concludes that administrative accountability at this planning stage is accountable or can be accounted for based on the availability of documents.

## **5. CONCLUSION**

Availability of supporting documents for managing village funds based on accountability principles at the planning stage the village government must have a Raperdes document on the APBDes, the APBDesa document is submitted to the Regent/Mayor through the sub-district head no later than October of the current year, the APBDesa document is evaluated by the Regent/Mayor for a maximum of 20 working days, and the Village coconut must make improvements for 7 days if the Village Budget is declared incompatible with the Village Reperdes and the priority document for the use of the Village Fund is determined in a village meeting between the BPD, Pemdes and Community Elements. Of the 4 documents, two of them are available and two of them are not available so that the authors conclude that they are less accountable.

The availability of supporting documents for managing village funds based on the principle of accountability at the implementation stage of the village government must have administrative completeness with the availability of administrative documents which include expenditure and receipt documents carried out through the Village Treasury account or according to district/city government regulations, with complete and complete evidence support. valid, documents for the procurement of goods and or services in the Village are regulated by the Perbup/Mayor, documents proving the treasurer keeps money in the Village Treasury and the amount is determined by the Perbup/Walokota, detailed RAB documents regarding the use of unexpected costs and ratified by the village head as well as in this implementation stage there may be no levies other than those stipulated in the village regulation. Among all that, what is available in the village of South Mataru is the completeness of the expenditure and receipt documents carried out through the Village Cash account, the Bank assistant book document as evidence that shows the village treasurer keeps money in the village treasury. Administrative completeness such as documents for procurement of goods and services as well as details of the 2020 RAB for the use of fees are not available. Thus, the authors conclude that the implementation stage can still be accounted for or accountable.

Availability of supporting documents for managing village funds based on the principle of accountability at the administrative stage, the village government must have administrative completeness with the availability of administrative documents that include recording of every receipt and expenditure, treasurer closes the books at the end of the month, accounts for money through reports, submits reports every month to the Village Head no later than the 10th of the following month, as well as the availability of the General Cash Book, Tax Assistant Cash Book, and Bank Book. From a number of administrative completeness, only report documents to the village head every month are not available, so the authors say they can still be accounted for or accountable.

APBDesa in the first semester and the end of the year is available, an accountability report for the realization of the implementation of the APBDesa submitted at the end of the fiscal year consisting of income, expenditure

and financing determined by the village regulation. end of year. The report format for the accountability report on the realization of the implementation is available. Thus the conclusion at the accountability stage is declared accountable or accountable.

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**THE CAPACITY OF THE NUSA KENARI REGIONAL PUBLIC DRINKING WATER COMPANY IN THE DRINKING WATER SERVICE SYSTEM IN TELUK MUTIARA DISTRICT, ALOR REGENCY**

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**ABSTRACT**

*One of the areas in East Nusa Tenggara which also has a Regional Public Drinking Water Company (PERUMDAM) is Alor Regency. It is important for PERUMDAM Nusa Kenari in increasing its institutional capacity to be able to obtain a more optimal level of service. In the context of providing services to the community and increasing regional competitiveness, adequate local government capabilities or capacities are required. Regional government capacity development always contains an understanding of various efforts to improve service performance to the community.*

*The method used in this study is a qualitative research method, with a case study approach with 45 informants with the type of qualitative data and quantitative data while the data sources in this study came from primary data sources and secondary data while the data collection method in this study was research Field Research ( Field Research ), Library ( Library Research ) while the Data Collection Techniques in this study were Observation, Qualitative Interviews and Qualitative Documents. Furthermore, the data obtained by researchers used the data analysis technique proposed by Bungin (2012:70), namely; Data Collection ( Data Collection ), Data Reduction ( Data Reduction ), Data Display and Verification and Confirmation of Conclusions ( Conclusion Drawing and Verification ).*

*The results of the study found that the capacity of Nusa Kenari PERUMDAM in the drinking water service system in Teluk Mutiara District was still very low and still needed a lot of improvement in institutional capacity development to be able to increase its service capacity. If each element that is in the organizational capacity (individual, organizational, system level) and organizational capacity (technical, managerial, and institutional) shows good symptoms then it is included in the supporting factor, but on the contrary if it shows bad symptoms then it includes in the inhibiting factor. If the supporting factors are more than the inhibiting factors, then the capacity of the organization is good, but on the contrary if there are more inhibiting factors in the organization, the capacity of the organization is still weak.*

*Keywords: Development, Capacity, Drinking Water, Region*

**1. PRELIMINARY**

East Nusa Tenggara, which is one of the provinces in Indonesia, has its own challenges in providing clean water because it is an archipelago and has different regional characteristics. In general, rainfall in the Indonesian region is dominated by the influence of several phenomena, including the Asia-Australia Monsoon Wind system, El-Nino, La Nina and other phenomena. The climatic conditions in the East Nusa Tenggara (NTT) Region cause rainfall to have distinctive characteristics compared to other regions. The NTT region has a savanna climate which is characterized by the presence of extensive grasslands. This is evidenced from historical rainfall data in the province of NTT which has a fairly long dry month, which is approximately 8 dry months in a row.

One of the characteristics that distinguishes NTT Province from other parts of Indonesia is its drier climate. In some areas, the annual water balance shows a deficit (Djuwansah, Utomo, and Sastramihardja, 2001). Researches conducted by the Center for Research and Development of Geotechnology-LIPI in NTT Province (Sule et al, 1989; Arsadi et al, 1995) are aimed at exploring groundwater (bore wells) as a source of alternative water resources in dry climates. The results show that the amount of available groundwater reserves is very limited and the exploitation costs are relatively expensive.

According to the 2019 NTT Clean Water Statistics Infographic (NTT Clean Water Statistics 2019, BPS NTT) it is known that the NTT Province of 22 regencies/cities in the NTT region there are only 16 clean water companies with a total workforce of 1,136 people. The percentage of the volume of clean water that is channeled is 76.44% for non-commercial, 5.46% for commercial and industrial, 2.22% for social, and 0.63% for special. Meanwhile, there was a water leak in the distribution which caused a loss of 15.25% (5.2 million m<sup>3</sup>).

The ownership status of the clean water company is entirely owned by the regional government with the largest source of capital, namely 68.75% coming from the local government, 30.06% from the central government and 1 company, a small part of whose capital comes from outside the local government finances, namely from foreign capital (government Australia) (NTT 2019 Clean Water Statistics, BPS NTT).

When viewed from the water production capacity in NTT Province, there is a fairly large vulnerability between potential production capacity and effective production capacity. Water production capacity is the machine's ability to produce clean water. There are two types of water production capacity, namely: (1) Installed (potential) production capacity is the maximum production capacity of clean water that can be produced by machines or equipment owned by the company in liters per second. (2) Effective production capacity is the average production of clean water produced in liters per second.

One of the areas in East Nusa Tenggara which also has a Regional Public Drinking Water Company (PERUMDAM) is Alor Regency. The capital city of Alor Regency is Kalabahi. The population of Alor is about 211,872 people, while its area is 2,928.88 km<sup>2</sup>. This district is in the form of an archipelago and is crossed by international trade shipping lanes to the Pacific Ocean. One of the areas that is the focus of clean water services provided by PERUMDAM Alor Regency is the city area which is a sub-district city of Alor Regency, namely Teluk Mutiara District.

Teluk Mutiara Subdistrict, Alor Regency has 16 administrative areas consisting of 10 Kelurahan and 6 Villages with a population of 50,927 people 10,368 families and an area of 80.18 Km<sup>2</sup>, which is located along the coast in a hilly bay, where there are also 8 streams that have been flooded. used to meet water needs.

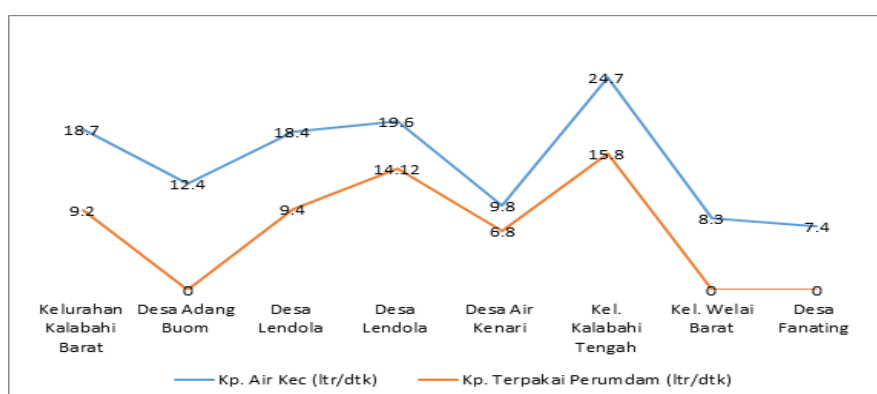
The drinking water service areas in Teluk Mutiara sub-district are West Kalabahi Village (Kenarilang River), Lendola Village (River. Seilan and Kampung Pisang River), Air Kenari Village (River. Air Kenari), Central Kalabahi Village (Sungai Tombang). As of December 31, 2020 the company has 4,767 domestic customers, consisting of 3,481 active customers and 1,286 inactive customers. All of these customers come from regular SR installations. The customers used for the calculation of service coverage are domestic customers with a total of 4,767 customers.

The number of people served in the administrative area of Teluk Mutiara Subdistrict is 23,835 people (4,767 families) or 46% of the total population of 50,927 people (10,368 families).

**Table 1.1** List of River Water Capacity as a Source of Drinking Water in Teluk Mutiara District (PERUMDAM Nusa Kenari, 2020)

No. –	Name River flow	Village / Village Location	Kp. District Water (Ltr/Sec)	Kp. Used PERUMDAM Ltr/Second
1	Canarylang River	West Kalabahi Village	18.7	9.2
2	Buono River	Adang Buom Desa Village	12.4	
3	Seilan River	Lendola Village	18.4	9.4
4	Banana Village River	Lendola Village	19.6	14.12
5	Water River Here	Canary Water Village	9.8	6.8
6	Tombang River	Ex. Middle Kalabahi	24.7	15.8
7	Sun Maase	Ex. West Welai	8.3	
8	Yase River	Fanating Village	7.4	
	<b>Amount</b>		<b>119.3</b>	<b>55.32</b>

Data on the capacity of river water as a source of drinking water in Teluk Mutiara District are as recorded in table 1.2. To make it easier to see how the difference between the sub-district water capacity and the capacity used in PERUMDAM will be illustrated in the following graph:



**Figure 1.1** Capacity of River Water as a Source of Drinking Water in Teluk Mutiara District (PERUMDAM Nusa Kenari, 2020)

From the data above, it can be seen that the sub-district water capacity and PERUMDAM water capacity differ quite a lot in several villages in Teluk Mutiara District. The same thing can be seen from the availability of sub-district water and the availability of water used by PERUMDAM. Judging from the amount of water discharge (ltr/sec), available water, water demand and ideal capacity, there are also quite striking differences between sub-district water and PERUMDAM water. This can be seen from the table below:

**Table 1.2** Availability of Water in Sub-District Water and Water for PERUMDAM Nusa Kenari (PERUMDAM Nusa Kenari, 2020)

No	River Stream Name	Water Discharge (Ltr/Second)	Water Demand Standard	Water Available in Kec. TM (Ltr/Hr)	Water Needs Kec. TM (Ltr/Hr)	Capacity Idea
1	District Water	119.3	60 (Ltr/Hr)	10,307,520	3,055,620	7,251,900
2	PERUMDAM water	72.5	60 (Ltr/Hr)	6,264,000	3,055,620	3,208,380

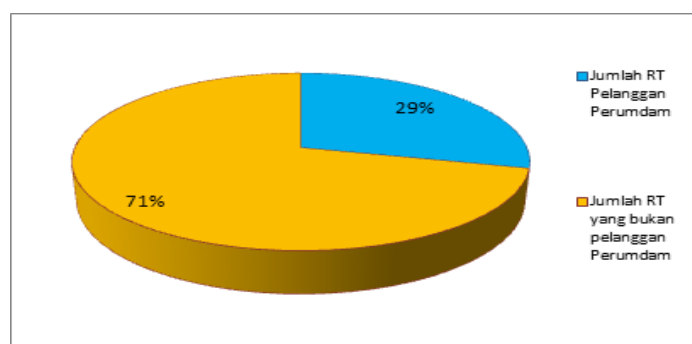
Based on the data above, it can be seen that the availability of sub-district water and perumpam water has a large enough difference. The availability of water managed by PERUMDAM itself continues to experience a reduction, which has an impact on the decline in the distribution of clean water to customers, this is caused by the condition of the existing network which is old, easily damaged and high liming, as well as the decreased capacity of raw water in springs which has an impact on seizure of water catchment areas between PERUMDAM and KP-SPAM in the village and the number of drill wells in the Kalabahi City area.

The above problems will certainly affect the people who are customers of the services of PERUMDAM Nusa Kenari, especially in the Teluk Mutiara Subdistrict. Data regarding the number of customers in Mutiara Bay are as follows:

**Table 1.3** Customers of PERUMDAM Nusa Kenari in Teluk Mutiara Subdistrict (PERUMDAM Nusa Kenari, 2020)

No	Customer Group	Number of Connections
1	Simple Household	2,798
2	Big Household	172
3	Small Commerce	69
4	Big Commerce	10
5	Public + Social Facilities	115
Amount		3.164

The data above shows that the total number of customers from PERUMDAM Nusa Kenari in Teluk Mutiara District is 3,164 consisting of simple households, large households, small businesses, large businesses, and public and social facilities. Meanwhile, based on BPS Alor data on Alor in Figures (2019), the population in Teluk Mutiara District is 53,339 with a growth rate of 0.42%. Meanwhile, the latest data on the number of households at the Alor Regency BPS in Alor Regency in Figures (2015) shows that Teluk Mutiara District has a total of 11,021 households. When viewed from the large number of households and the number of households that are customers of PERUMDAM, the percentage is very small. The comparison between the number of households that are PERUMDAM customers and those who are not served can be seen in the following figure:



**Figure 1.2** Comparison of Number of RTs Served by PERUMDAM and Unserved 2020 (Researcher Analysis)



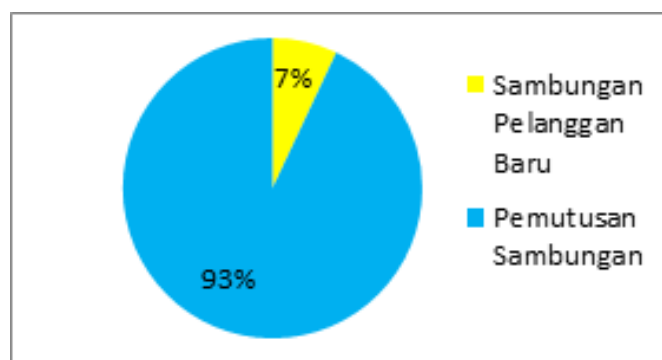
Judging from the available data, PERUMDAM Nusa Kenari only serves a small portion of the people of Teluk Mutiara Subdistrict, which is 29%, while most of the people in Teluk Mutiara Subdistrict at 71% have not been served by PERUMDA Nusa Kenari.

With a small number of service customers, PERUMDAM Nusa Kenari has not yet carried out an independent performance assessment. Performance appraisal from PERUMDA Nusa Kenari always depends on performance appraisals carried out by external parties such as BPKP for example (BPKP NTT, 2021). As the performance assessment carried out by BPKP (2021) based on the indicators of the Ministry of PUPR, the performance value of PERUMDAM Nusa Kenari based on the performance indicators of BPPSPAM (Agency for Improvement and Implementation of the Drinking Water Supply System), PERUMDA Nusa Kenari, Alor Regency for the fiscal year 2020 is 2.02 or into the "Pain" category. Compared to 2019, there was even a decrease in the value of the performance level by 0.25 from 2.27 to 2.02 (BPKP: 2021).

Meanwhile, for performance research based on the indicators of the Ministry of Home Affairs No. 47 of 1999 concerning Guidelines for Performance Assessment of Regional Drinking Water Companies, PERUMDA Nusa Kenari, Alor Regency for the 2020 financial year amounted to 44.82 with the "Less" category. Compared to 2019, there was a decrease in the performance value of 3.10 from 47.92 to 44.82.

Meanwhile, in the RPJMD, the Alor Regency Government has not set a service coverage target that must be achieved by the company by the end of 2020. With a service coverage that must be achieved by the company by the end of 2020. With a service coverage of 29% for the Telyk Mutiara sub-district in 2020, taking into account the trend of service coverage for the entire service area of PERUMDA Nusa Kenari in the last three years has decreased from 14.63% in 2018 to 10.42% in 2020. It can be concluded that the company is not ready to support the target of 100% access to national drinking water.

During 2020, PERUMDA Nusa Kenari has made efforts to increase service coverage by adding 29 new customer connections (House Connections. However, in 2020, PERUMDA Nusa Kenari also disconnected 384 SR subscribers (BPKP: 2020). This can be seen from the diagram, as follows:



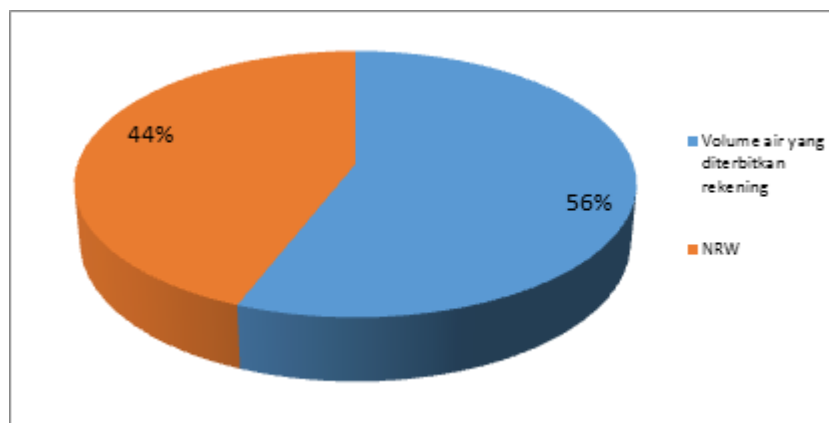
**Figure 1.3** Comparison of the Number of New Connections and Termination of Connections (BPKP: 2020)

Looking at the data above, it shows that although there are a number of new house connections, the number of disconnections is much higher and until now there has been no local government effort to increase the service coverage of PERUMDA Nusa Kenari in 2020.

Another problem that emerged as BPKP's findings (2020) in its report also found problems in quality, quantity, and continuity (3K) as well as the preparation of the RPAM. The main problem is regarding quality and continuity which has not been met to date. The water quality has not met the requirements set out in the Minister of Health Regulation No. 492/MENKES/PER/VI/2010 dated 18 June 2010 concerning the Management of Drinking Water Quality Supervision. External monitoring of drinking water quality has been carried out by the Alor District Health Office, although it has not met the minimum sample size. PERUMDA Nusa Kenari has not provided ready-to-drink water services by implementing the Prima Drinking Water Zone (ZAMP) and has not implemented Smart Grid Water Management (SGWM).

Problems also occur with regard to the rate of water loss. Loss of water ( Non Revenue Water / NRW ) can be interpreted as the recorded difference or the difference between the water produced and entered into the system with the amount of water recorded on the customer meter. With this understanding, the loss of a certain amount of water that can occur due to leaving the system without being used or not recording water use due to various reasons. Water loss based on the cause can be classified as physical water loss and non-physical loss. Physical losses are losses caused by leaks that occur in system components, in reservoirs, in pipes both distribution and transmission, or in house connections. Non-physical losses are water losses that are not physically visible but

can be known from calculations and records of the amount of water distributed to customers. All include various administrative and management errors and vulnerabilities as well as system equipment, including meter reading and recording errors (production and customers), unmetered water usage, unpaid water usage, illegal connections and water theft, estimated usage, and administrative errors. account, so that water is used but not recorded in the account. At PERUMDAM Nusa Kenari the volume of water distributed to customers is 1,382,528 m<sup>3</sup>, the volume of water that has been issued by accounts to customers is 773,558 m<sup>3</sup>. So there is a distribution NRW of 44.05%. This is because the customer's water meter is damaged and has never been calibrated and the distribution network is leaking. The difference between the volume of water that has been issued by accounts to customers and the volume of NRW can be seen in the following diagram:



**Figure 1.4** Comparison of Billed Water Volume and NRW Volume (BPKP: 2020)

From the data shown above, the level of water loss is quite large, reaching 44%. Of course, this is for government organizations that also carry out the profit function, which is a big loss because in the end PERUMDAM Nusa Kenari also experienced a loss rate of 44%. This is in line with the results of observations made by BPKP (2020) regarding customer connections. The results of the physical inspection of the BPKP review team to the field in the service area for 45 customer connections, with the result that 22 connections did not have water meters and 23 connections were equipped with water pipes with damaged conditions.

From the various problems described above, it becomes important for PERUMDAM Nusa Kenari in increasing its institutional capacity to be able to obtain a more optimal level of service. In the context of providing services to the community and increasing regional competitiveness, adequate local government capabilities or capacities are required. Regional government capacity development always contains an understanding of various efforts to improve service performance to the community.

In the process of institutional capacity development, it can be seen from the point of view of organizational theory but can also directly refer to the concept of organizational capacity which can also be studied in capacity development theory. Capacity development or better known as capacity development or capacity building has various definitions. Grindle and Hilderbrand, (1995) define capacity building as "improvements in the ability of public organizations, either single or cooperation with other organizations, to perform appropriate tasks". In other words, capacity building is an increase in the ability of public organizations to achieve certain goals, both independently and in collaboration with other organizations. Horton et al. (2003) which explains that capacity development is "an ongoing process to increase the ability of the organization to carry out its functions and achieve its objectives, and to learn and solve problems". This concept describes capacity development as the ability to perform basic functions, namely goal achievement, learning and problem solving. This opinion is almost the same as that expressed by Milen (2001) who sees capacity building as a "continuing process of strengthening of ability to perform core functions, solve problems, define and achieve objectives and understand and deal with development needs". This concept explains that the capacity development process is an ongoing process related to strengthening the ability to perform core functions, solve problems, define and achieve goals and understand and address development needs.

After seeing the concept of institutional capacity development which is then linked to various problems that have also been described previously relating to the services of PERUMDAM Nusa Kenari, the researcher assumes that all these problems must be solved by strengthening or developing institutional capacity in this case the capacity development of PERUMDAM Nusa Kenari, Alor Regency. . So the researcher feels it is important to conduct a study that will discuss the capacity development of PERUMDAM in the context of the service system for the regional public drinking water company. So that researchers are interested in conducting research

with the title: **“The Capacity of the Nusa Kenari Regional Public Water Company in the Drinking Water Service System in Teluk Mutiara District, Alor Regency”**.

## **2. LITERATURE REVIEW**

### **2.1 Capacity Building (Capacity Building)**

Eade (1997 in Dwiyanto, 2002:17) suggests that capacity building can be defined as a major approach in development that aims to strengthen human capacity so that they can determine for themselves what is useful for them to make changes for the future.

There are several requirements for capacity building (especially local government) namely participation, access to information, accountability and leadership ( Warsito and Yuwono, 2003 ). First ; Participation, which is where government officials must follow all levels in terms of capacity building, both at the leadership level to the staff level. Which is where participating in this capacity building can increase knowledge, skills, and self-confidence. Second; access to information, this requirement is no less important for capacity building for government officials. This capacity building must be started by providing access to information for the development of the apparatus' capacity to increase the knowledge capacity of the apparatus themselves. Third; accountability, this is also an equally important condition. Accountability in capacity building so as to carry out programs must be ensured that these programs are legitimate , accountable and accountable programs later. Fourth , leadership, which plays a very important role in the capacity development program of an organization. The more leaders give confidence to employees to develop, then that's where we can see whether the capacity development program in an organization is successful.

Capacity building is an effort to develop a variety of strategies to improve the efficiency, effectiveness, and responsiveness of government performance. Namely efficiency , in terms of time (time) and resources (resources) needed to achieve an outcome ; effectiveness , in the form of the appropriateness of the effort carried out for the desired result; and responsiveness , namely how to synchronize between needs and abilities for that purpose. (Grindle, 1997 in Riyadi, 2006:11).

Morison (2001) defines capacity building as a process for carrying out a, or series of movements, multi-level change within individuals, groups, organizations and systems in order to strengthen the adaptability of individuals and organizations so that they can respond to environmental changes. which exists.

Capacity development is an effort intended to develop a variety of strategies to improve the efficiency, effectiveness and responsiveness of organizational performance. This is as stated by Haryono (2012:39) as follows: Capacity building is intended to encompass a variety of strategies that have to do with increasing the efficiency, effectiveness, and responsiveness of government performance . strategies that can improve the efficiency, effectiveness and responsiveness of government performance). Then Philbin (1996:20) defines Capacity Building as follows: “Capacity building is defined as the "process of developing and strengthening the skills, instincts, abilities, processes and resources that organizations and communities need to survive, adapt, and thrive in the fast-changing world.” Capacity building as a process of developing and improving the skills, talents, capabilities of organizational resources as a need to survive, adapt, and grow the organization in an era of rapid change.

### **2.2 Stages of Capacity Development**

The stages or phases of institutional capacity development according to Gandara (2008) are as follows:

1. Preparation Phase. In this phase there are 5 working steps, namely:
  - a. Identification of the need for capacity building, this work step has the main activity of identifying the reasons and the real need to develop capacity.
  - b. Define goals. This work step has the main activity of conducting consultations with key stakeholders to identify the main issues of capacity building.
  - c. Give responsibility. This work step has the main activity, namely determining the person in charge of capacity building activities, for example forming a technical team or work unit.
  - d. Designing a capacity building process. This work step has the main activities, namely determining the mapping methodology according to the problems that arise and scheduling activities regarding the mapping process and the next stage of formulating a capacity building action plan.

e. Resource allocation. The main activities are identifying funding for capacity building process activities and allocating resources by formulating resource requirements according to the required budget and can be approved by the authorities.

## 2. Analysis Phase. in This Phase There are 5 Working Steps, Namely:

- a. Identifying problems, in this case, the main activity is in the form of examining the problem for further investigation.
- b. Analysis of the process, in this case the main activity is in the form of linking problems for capacity mapping with system, organizational and individual performance processes.
- c. Organizational analysis in this case the main activity is in the form of selecting an organization to be investigated more deeply (organizational mapping).
- d. Mapping the gap in capacity, in this case, the main activity is in the form of mapping the gap between the ideal capacity and the reality.
- e. Summarizing urgent capacity building needs, in this case, the main activity is in the form of summarizing findings and collecting proposals for capacity building action plans.

## 3. Planning Phase. in This Phase There are 3 Working Steps, Namely:

- a. Annual planning, the main activity of which is to formulate a draft capacity building action plan.
- b. Make a medium term plan, the main activity is in the form of consultative meetings.
- c. Develop a priority scale, the main activity of which is to determine the priority scale of capacity development and the stages of its implementation.

## 4. Implementation Phase. in This Phase There are 5 Working Steps, Namely:

- a. Programming, the main activity of which is allocating current resources.
- b. Planning for capacity building projects, the main activity of which is to formulate policies for implementing capacity development.
- c. Selection of providers of capacity development services, the main activity of which is to identify external services and products related to the implementation needs of capacity development to be carried out.
- d. Project implementation, the main activity of which is the implementation of the annual capacity development program according to available resources and available schedule.
- e. Process monitoring, the main activity of which is to monitor capacity building activities.

## 5. Evaluation Phase. in This Phase There are 2 Working Steps, Namely:

- a. Impact evaluation, the main activity is evaluating the achievement of capacity development, such as improving performance.
- b. Re-planning the action plan for capacity building, the main activity is to analyze the findings of process monitoring and impact evaluation in the context of the need for capacity building re-planning.

The activities mentioned above are very necessary in increasing institutional strength in building the achievement of organizational goals. More Sedarmayanti (2004:336) says that: "Institutional capacity development is a very important and decisive part of bureaucratic reform , so that it really leads to efforts to realize a government that meets the criteria of good governance ".

## 2.3 Organizational Capacity Development

In the simplest terms, organizational capacity is the ability to carry out organizational activities (Yu-Lee, 2002). In the public sector, organizational capacity has been broadly defined as the government's ability to structure, develop, lead and control human, financial, physical and information resources (Ingraham, 2005). In the social or non-profit sector, organizational capacity is a set of management practices, processes or attributes that help an organization to fulfill its mission (Eisinger, 2002).

The same thing was expressed by Horton et al. (2003) explains that organizational capacity is "its potential to perform - its ability to successfully apply its skills and resources to accomplish its goals and satisfy its stakeholders' expectations". In this concept, it is clear that the relationship between the external environment of the organization and the activities of the organization is clearly visible.

In its development, the concept of organizational capacity has many points of view according to experts. There are those who explain that the meaning of capacity is only a matter of the acquisition of resources or funds (Kushner and Poole, 1996; Brooks, 2002). Another opinion explains that capacity includes any quality that can hinder or promote success in achieving organizational goals (Chaskin et al, 2001). On the other hand, organizational capacity is sometimes defined as the internal quality of the organization, which consists of human and capital resources (Brinkerhoff, 2005) and on the other hand is considered a concept with both internal and external dimensions, for example external financial support, supportive relationship network, training resources, and political support (Forbes and Lynn, 2006).

Organizational capacity development is not only multidimensional, but also capable of being divided into different functional categories. Eisinger (2002), for example, defines the essential elements of social organizational capacity as resources, effective leadership, staff skills and adequacy, institutional and external relations. While Ingraham et al. (2003 in Irawan, 2016) describes four management subsystems whose dimensions are the capacity of government organizations, namely finance, human resources, capital and information technology systems.

Horton et al. (2003) explained that organizational capacity development is generally related to the resources, knowledge and processes carried out by the organization. Staff, infrastructure, technology and financing are the basic resource capacities of every organization. In addition, strategic leadership, program and process management, and networking and linkages with other parties, are management capacities in organizations.

Christensen and Gazley (2008) explain that organizational capacity as a function of (1) organizational infrastructure, (2) human resources, (3) financial resources and management systems and (4) political characteristics and market demands as the external environment. Some of the above factors serve as a synthesis and a way to facilitate a more operational understanding of the variables of organizational capacity development.

Christensen and Gazley (2008 in Irawan, 2016) explain that the difficulty in defining organizational capacity development lies in the quality of understanding both as inputs or resources and processes. This opinion is reinforced by Sowa et al. (2004) which explains that the best capacity is seen as a concept consisting of structure and process.

From some of the opinions above, the author tries to relate the factors that are the reference in measuring organizational capacity with the level of organizational activity according to Thompson (2003). Several factors that have been mentioned by several experts such as Eisinger (2002), Horton et al. (2003), Christensen and Gazley (2008) conceptually can be grouped into three levels of organizational activity proposed by Thompson (2003), namely the technical level, managerial level and institutional level. When the opinion above is used as a reference in determining the factors that will be analyzed further in this study, considering the three concepts offered completely explain all levels of capacity to be studied. The following table will briefly describe the analysis.

**Table 2.1** Classification of Organizational Capacity by Activity Level

Activity Level	Eisinger (2002)	Horton et al. (2003)	Christensen & Gazley (2008)
Technical	Staff resources, skills and adequacy	Staff, infrastructure, technology, financing	Human resources, infrastructure, finance
managerial	effective leadership	Strategic leadership, program, process management	Management system
Institutional	institutional and external relations	Networks and linkages	Political characteristics, market demand

**Sources:** Thomson (1967), Eisinger (2002), Horton et al. (2003), Christensen and Gazley (2008)

From the table above, it can be concluded that the characteristics of organizational capacity consist of:

1. Technical capacity, including: human resources, infrastructure, technology and financing.
2. Managerial capacity, including: effective leadership, program and management system.
3. Institutional capacity, including: networking, involvement of other parties, political characteristics and market demand.

This overall capacity can be investigated further in the context of public service delivery organizations. The ten factors in measuring organizational capacity include: human resources, infrastructure, technology, financing,

effective leadership, programs, management systems, networks, linkages with other parties, political characteristics and market demands.

#### **2.4 Water Demand Analysis**

The use of water by a community increases with the progress of the community, so that the use of water is often used as a measure of the high and low progress of a society. Types of Raw Water Needs According to Terence (1991) the raw water needs in a city are classified, among others:

1. Domestic needs. Domestic needs are the need for clean water to fulfill daily or household activities such as drinking, cooking, individual health (bathing, washing, etc.), watering plants, yard, transporting waste water (kitchen and toilet waste).
2. Non-domestic needs. Non-domestic needs are raw water needs used for several activities such as: (a) institutional needs, (b) commercial and industrial needs, (c) public facilities needs, are clean water needs for activities of places of worship, recreation, terminals.
3. Leakage and water loss. The amount of water demand due to leakage and water loss is quite significant. Leaks and water loss are caused due to illegal connections and leaks in the system which mostly occur in accessories and pipe connections.

#### **3. METHOD**

The method used in this study is a qualitative research method, with a case study approach with 45 informants with the type of qualitative data and quantitative data while the data sources in this study came from primary data sources and secondary data while the data collection method in this study was research Field Research ( Field Research ), Library ( Library Research ) while the Data Collection Techniques in this study are observation, qualitative interviews and qualitative documents.

In analyzing the data, the data obtained by the researcher used the data analysis technique proposed by Bungin (2012:70), which is as follows:

##### **1. Data Collection (Data Collection)**

Data collection is an integral part of data analysis activities. Data collection activities in this study were using interviews and documentation studies.

##### **2. Data Reduction ( Data Reduction )**

Data reduction is defined as the selection process, focusing on simplification and transformation of rough data that emerges from written notes in the field. Reduction is carried out since data collection begins by making summaries, coding, tracing themes, making clusters, writing memos and so on with the aim of eliminating irrelevant data/information.

##### **3. Data Display**

Display data is a description of a set of structured information that provides the possibility of drawing conclusions and taking action. The presentation of qualitative data is presented in the form of narrative text. The presentation can also be in the form of matrices, diagrams, tables and charts.

##### **4. Verification and Confirmation of Conclusions (Conclusion Drawing and Verification )**

Is the final activity of data analysis. Drawing conclusions in the form of interpretation activities, namely finding the meaning of the data that has been presented.

#### **4. DISCUSSION**

The fundamental purpose of organizational development is to improve the capabilities of the organization itself. Increasing organizational capacity has an impact on the organization's capacity to make quality decisions by making changes to the structure, culture, tasks, technology and human resources. The main approach to this is the form of organizational capacity that can maximize the involvement of people in making effective decisions in carrying out organizational tasks.

The study of organizational development aims to develop the organization as a whole and as a special reference for the development of renewable organizational capacities (Kondalkar, 2009:47). In this concept, organizational development efforts on the one hand are through the development of its own capacity. This means that the organizational capacity at the technical, managerial, and institutional levels of the organization must be able to develop according to the needs of the organization in realizing responsive services.

From some of the opinions above, the author tries to relate the factors that become a reference in measuring the capacity of the Nusa Kenari Regional Public Water Company in the drinking water service system in Teluk

Mutiara District, Alor Thompson Regency (2003). Several factors that have been mentioned by several experts such as Eisinger (2002), Horton et al. (2003), Christensen and Gazley (2008) conceptually can be grouped into three levels of organizational activity proposed by Thompson (2003) namely the technical level, managerial level and institutional level. When the opinion above is used as a reference in determining the factors that will be analyzed further in this study, considering the three concepts offered completely explain all levels of capacity to be studied with the results of the research and discussion as follows:

#### **4.1 Technical Capacity**

Technical capacity, including; human resources, infrastructure, technology and financing. Broadly speaking, the definition of Human Resources is an individual who works as a driver of an organization, both an institution and a company and functions as an asset that must be trained and developed. While infrastructure in general can be defined as all the basic structures and facilities needed for the implementation of a community or company activity, including physical and social. Furthermore, technology in the organization is defined as the means or devices needed by the organization in carrying out its activities. financing is funding support for the need or procurement of certain goods/assets/services whose mechanism generally involves three parties, namely the funding party, the provider of certain goods/assets/services, and the party utilizing certain goods/assets/services.

Morison (2001 in Riyadi, 2006:12) defines capacity development as a process to carry out a, or a series of movements, multi-level change in individuals, groups, organizations and systems in order to strengthen the adaptability of individuals and organizations. so that it can be responsive to changes in the existing environment where in the structure owned by PERUMDAM Nusa Kenari, Alor Regency, it can be seen that the PERUMDAM Nusa Kenari Organization is led by a director. The director is under the supervision of the Banwas (Supervisory Agency) which has changed its name to IRDA (Regional Inspectorate). One of the functions of the Regional Inspectorate is to supervise OPD-OPD in the region. Furthermore, the director and the inspectorate are responsible to the bupati .

At the micro level capacity development focuses on individuals and groups as a collection of individuals, capacity development focuses on providing professional and technical resources (Grindle, 1997; Dill, 2000; Horton et al., 2003) but in the authors' findings it is known that the structure there are problems such as in the General and Finance Section where there are often rejections of bills to the community because the customer community feels that the bill is not proportional to the volume of water obtained. Another problem is in the Sub - section of Bookkeeping and Reporting where the mastery of technology is not good enough. Furthermore, seen from the Engineering Section, especially in the Production and Processing Resources Subsection , the problems that arise are related to the quality of HR. People who are in this structure they do not have a good quality of expertise because they do not come from people with basic technical education.

The sub - section of technical planning and supervision also has problems, this has caused this section to only carry out the supervisory function. The next problem that arises is the Sub - section of Maintenance and Maintenance where an insufficient budget is available which usually causes this maintenance and maintenance activity to not run or continue to run but is only carried out as a temporary treatment because it uses makeshift techniques and equipment.

On the other hand, organizational capacity is sometimes defined as the internal quality of the organization, which consists of human and capital resources (Brinkerhoff, 2005) and on the other hand is considered a concept with both internal and external dimensions, for example external financial support which in the authors' findings from the perspective of In terms of financing, PERUMDA Water Drinking Nusa Kenari, Alor Regency has a profit/loss report when it comes to financial performance, the level of profitability is quite good. When viewed from the document data as shown above and the findings based on observations and interviews conducted by researchers related to financial performance, it was found that the level of profitability of PERUMDAM was quite good but still lacking because PERUMDAM Nusa Kenari was only able to provide benefits that could be seen from the ROE value of 9.82%.

Furthermore, based on the cash ratio, it is known that PERUMDA Airminum Nusa Kenari, Alor Regency has a low cash ratio to meet short-term obligations but based on the solvency ratio, the value obtained is 1091.10% . The solvency value >100% in Alor Regency is very large, meaning that the assets currently owned are still able to cover the long-term liabilities/debts of PERUMDA Water Drinking Nusa Kenari, Alor Regency.

It can be stated that organizational capacity development at the system level has not been effective so that PERUMDA Water Drinking Nusa Kenari, Alor Regency needs to develop a new strategic plan aimed at making the organization achieve its goals clearly and be able to design the organization to ensure efficiency, effectiveness, responsiveness and regional development programs will right on target when compiled based on

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accurate data and needs in accordance with the field context. The data found by the authors can later be used as a reference for determining targets to be achieved (Horton et al, 2003)

#### **4.2 Managerial Capacity**

Managerial capacity, including; effective leadership, programs and management systems Dill (2000) as a macro structure where effective leadership is where the leadership is able to motivate subordinates to continue to strive for success, have a passion for work, be productive, result oriented and of course will have a positive impact on employees. the company or group being led. Effective leadership coupled with support from subordinates or work partners who are always motivated to move forward will certainly have a positive impact on the internal and external scope. Furthermore, the work program or commonly referred to as the activity agenda is an organizational activity plan that is prepared for a certain period of time and has been agreed upon by all organizational management. Generally, this work program is made in a very detailed and directed manner because it becomes a guideline in achieving organizational goals.

While the management system is a framework of processes and procedures used to ensure whether the company or organization can meet standards and carry out their duties to achieve organizational goals. The goals of a company or organization can be in the form of meeting customer quality requirements, complying with regulations both government regulations, state laws or regulations from customers and achieving goals/responsibility to environmental aspects.

Judging from effective leadership, based on the results of the study, it shows that the leadership in PERUMDAM Nusa Kenari is not so strong. This lack of strong leadership then causes the organization to move with a very slow movement of progress and even tends to run in place in a slumped condition.

The above statement appears based on the findings of the research which shows that the method of recruiting prospective leaders or directors at PERUMDAM Nusa Kenari has not been carried out properly because it does not include the requirement that those who can nominate themselves are those who have basic technical drinking water so that they have sufficient knowledge in making policy planning. .

The above concerns were later proven by the current leadership, where those who were elected and became directors were people with an economic background so they did not have enough knowledge related to drinking water problems. This has resulted in the 5 years of leadership not being able to answer all drinking water problems in Alor Regency which also resulted in suboptimal services to the community such as water service schedules that were not able to be planned properly so that many complaints and protests were received from the community. .

The results of the study show that there are several long-term programs such as the construction of Water Management Installations (IPA), and replacement of the main transmission and distribution pipes, procurement of tank cars, and the development of house connections, some of these programs aim to fulfill the distribution of clean water to people's homes.

#### **4.3. Institutional Capacity**

Institutional capacity includes: networking, involvement of other parties, political characteristics and market demands. Networking in this research is an effort to build relationships with other parties to run and achieve common goals. This is related to the involvement of other parties because it also involves the concept of networking in it. Political characteristics are political systems that are built within an organizational scope. Meanwhile, market demand is a desire accompanied by the ability to buy goods and services at a certain price and time. In this case, it is the community's desire to obtain clean water services from PERUMDAM Nusa Kenari.

##### **a. Network**

Based on the results of the study, it was found that the network and involvement of other parties that had been built by PERUMDAM was still a matter of dispute between PERUMDAM and also the village level government. In this case, PERUMDAM workers are usually contacted personally by the village to repair the problematic pipe network because the village government does not have enough skills for that. The pipe network that is usually requested by the village to be repaired is the clean water pipe network belonging to the village, not the PERUMDAM clean water pipe network.

In addition, the network and involvement of other parties built by PERUMDAM Nusa Kenari and the local government in this case the Regional Government of Alor Regency has not been so good and strong so that PERUMDAM Nusa Kenari seems to have not been given much attention by being given a capital injection so



that the existing budget at PERUMDAM Nusa Kenari is very low. limited and unable to finance the operational activities of PERUMDAM.

#### **b. Involvement of Other Parties**

PERUMDAM Nusa Kenari has been able to build a network and involvement of other parties with the Central Government through the Ministry of PUPR, as can be seen from the Construction of a Drinking Water Supply System (SPAM) in the Kalabahi Tengan Village from the Tombang Spring which has been built by the Ministry of PUPR through the NTT Regional Settlement Center. . The activity was carried out by the ministry / BPPW NTT itself by involving PERUMDAM Nusa Kenari with the Technical OPD for Housing and Land Areas in Alor Regency. After the SPAM facility is finished, there is only a handover from the ministry to the regional government, then the regional government will hand it over to PERUMDAM.

Networking and involvement of other parties by PERUMDAM together with the private sector, based on research results to date have never been carried out by PERUMDAM Nusa Kenari. One aspect of the lack of capital for PERUMDAM Nusa Kenari is the lack of capital participation from other parties. PERUMDAM Nusa Kenari only depends on the budget that will be provided by the Alor Regency Government, which until now has paid very little attention to PERUMDAM Nusa Kenari.

#### **c. Political Characteristics and Market Demand**

The current political characteristics in Alor Regency related to PERUMDAM Nusa Kenari can be seen from several points, the first point is how the political characteristics that occur in PERUMDAM Nusa Kenari are seen from PERUMDAM's relationship with the legislature. The political character that has existed so far has resulted in a capital injection vacuum from 2018 until now due to the weak network or political understanding between PERUMDAM Nusa Kenari and the Legislature. In fact, if you look at the people sitting in the legislature, not a few are people who care about drinking water or who are former PERUMDAM employees. There is an impression of mutual waiting and mutual misunderstanding between these two institutions.

The next point relates to how the political characteristics so far working in Alor Regency relate to PERUMDAM Nusa Kenari is in the recruitment of PERUMDAM Nusa Kenari employees in this case are contract employees. Contract employees so far who are able to fill it are people who have a relationship or emotional closeness with officials in the government or the legislature. In other words, the recruitment of contract employees at PERUMDAM Nusa Kenari is full of political affinity factors. The people who are selected and included in PERUMDAM are people who are "entrusted" from government figures. This then has a bad impact because the community in general is not involved and it is impossible to get into government organizations because the recruitment is internal to the government, so it is the people who are close to government actors who have access to enter. In addition, another bad impact is that employees who enter through political networks have a low level of compliance with organizations and leaders because they feel they have great power behind them.

is the political characteristics in terms of choosing a leader in the PERUMDAM organization, in this case the Director is also a separate problem . This recruitment is too political because it is carried out by the Secretariat of the Economy Section and other structural officials such as Assistant II. Meanwhile, people from the technical OPD are not involved. This causes the selected people to not be considered for their technical capacity or people who really understand the technical problems of PERUMDAM Nusa Kenari . In addition, people who are elected to become PERUMDAM leaders because they are generally open to people from the community who occupy these positions, the people who are always elected are people from the majority race or people who already have big names in the community. which will be selected.

### **5. CONCLUSION**

Based on the results of the research and discussion described above, it can be concluded that the capacity of Nusa Kenari PERUMDAM in the drinking water service system in Teluk Mutiara District is still very low and still requires a lot of improvement in institutional capacity development to increase its service capacity. If each element that is in the organizational capacity (individual, organizational, system level) and organizational capacity (technical, managerial, and institutional) shows good symptoms then it is included in the supporting factor, but on the contrary if it shows bad symptoms then it includes in the inhibiting factor. If the supporting factors are more than the inhibiting factors, then the capacity of the organization is good, but on the contrary if there are more inhibiting factors in the organization, the capacity of the organization is still weak.

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**IMPLEMENTATION OF WASTE MANAGEMENT POLICIES IN BETUN CITY, CENTRAL MALACCA DISTRICT, MALACCA REGENCY**

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**ABSTRACT**

*Garbage disposal in Betun City Malacca Regency is also not balanced with the existing carrying capacity and capacity. Waste management system in Betun City Malacca Regency can also be said to still be classified as using traditional concepts, namely the concept of gathering, transporting and throwing away. This system is still being used because there is no better way to manage waste. This waste will be a problem if it is not processed properly and is not utilized.*

*This research was conducted from August to September 2021 in Betun City, Central Malacca District, Malacca Regency by using qualitative research method, with a case study approach with informants amounting to totaling 23 people.*

*The results of the study found that Implementation of waste management policies in Betun City, Central Malacca District, Malacca Regency use The theoretical model of policy implementation from Merilee S. Grindle (1980:11) which states that the success of policy implementation is influenced by the content of policy which results in the following conclusions; (a) the interests of the actors involved have not been affected by the waste management policy in Betun City, (b) the types of benefits to be generated in its implementation have not been effective due to community habits, limited facilities and infrastructure and inadequate human resources (c) the desired degree of change is still lacking in the implementation stage where the waste problem is still an environmental problem in the City of Betun (d) the location of policy decision making is based on bottom-up decision making, (e) the program implementer is the Malacca Regency Government with responsibility to the Regency Environmental Service Malacca, while the implementation at the lowest level, which is directly dealing with the community as the target of the policy is left to the garbage collectors (f) the resources deployed are human, financial and infrastructure resources but not enough while for (content of implementation) is (a) The interests affected by the policy are the creation of a clean and waste-free Betun City, (b) the characteristics of institutions and authorities have not been able to build good communication with the community, (c) the compliance and responsiveness of implementing actors are ready and obedient to succeed the leadership's orders.*

*The inhibiting factors for waste management in Betun City, Central Malaka District, Malacca Regency consist of internal factors, namely; (a) limited human resources (b) limited facilities and infrastructure and (c) law enforcement that has not been maximized while for external factors, namely; (a) waste production which always increases every year, (b) public awareness is still low (c) waste management for recycling is still low.*

*Keywords: Policy, Implementation and Waste*

**1. PRELIMINARY**

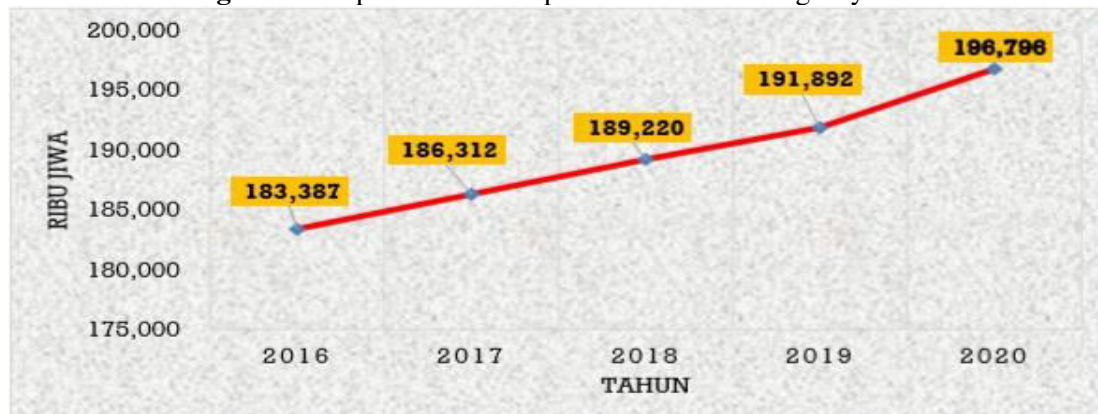
Problems related to waste management do not only occur in developed countries, but also become one of the main problems in Malacca Regency. Therefore, referring to Law Number 23 of 2014 concerning Regional Government, regions are given the authority to regulate and manage their own government affairs. The goal is to accelerate the realization of community welfare in the region. This means that with the autonomy, the regions are given full authority to make a number of policies that are in accordance with the characteristics of the region and the aspirations of the community, especially in terms of regional financing originating from regional revenues and revenues.

In this regard, the government issued Law Number 18 of 2008 concerning Waste Management. As a form of embodiment of these laws and regulations, the regions make policy products related to waste in order to improve environmental hygiene and health based on the potential that exists in the region. One type of policy that is quite potential is the retribution for waste/cleaning services as carried out by the Malacca Regency Government by issuing the Malacca Regency Regional Regulation Number 13 of 2016 concerning Public Service Retribution and in the Regional Regulation,

With the stipulation of Malacca Regency as a New Autonomous Region in 2013 with the enactment of Law of the Republic of Indonesia Number 3 of 2013 concerning the Establishment of Malacca Regency in East Nusa Tenggara Province, automatically all activities of the people of Malacca Regency will be largely centralized and

concentrated in the Regency itself, especially in Betun City as the capital of Malacca Regency. To note that the population growth of Malacca Regency every year continues to increase as shown in Figure 1.1 below:

**Figure 1.1** Population Development of Malacca Regency Year



**Source:** Malacca District Medium Term Development Plan 2021-2026

Based on the figure, it is known that in 2016 the population of Malacca Regency was 183,387 people and increased in 2017 to 186,312 people, in 2018 to 189,220 people then increased again in 2019 to 191,892 people and in 2020 increased by 196,796 people. This increase in population and activities that are concentrated in one location (Betun City) have also contributed to the increase in the volume of waste produced because the community is the main producer of the waste itself.

It is known that waste management in Betun City Malacca Regency still cannot be declared optimal with the largest volume of waste sourced from residential and market waste. The composition of waste from each source is generally different, namely waste from residential areas mostly consists of waste made from organic (food scraps, vegetables and rotting fruit), for waste from shops and markets in the form of inorganic waste such as plastic, cans, bottles and paper. The waste generated by schools and hospitals consists of paper, bottles and plastics and the composition of waste from public places such as terminals is plastic, paper and leftover food.

In Malacca Regency, the highest amount of waste generated is in 4 (four) Districts, namely West Malacca, Central Malacca, Kobalima and East Malacca. In Malacca Regency there has been an increase in the amount of waste generation for the last 3 (three) years in Central Malaka District, especially in Betun City, in 2018 amounting to 6732 tons and this amount of waste generation increasing significantly in 2020 with a total of 7351 tons of waste. Central Malacca District is the District with the largest population of people in Malacca Regency, this will directly have an impact on the amount of waste generated.

This waste problem can only be solved if there is a good final disposal system. A good final waste disposal system is the collection of waste in a place with monitoring, because this way can maintain environmental quality and prolong the use of landfill land. Disposal of waste in this manner is carried out with the aim that the implementation of waste policies can run on target. Policy implementation in principle is a way for a policy to achieve its goals. The implementation of this waste service retribution policy was made considering that: Betun City Malacca Regency has a population that is increasing along with regional developments.

So far, waste management in Betun City Malacca District has not been optimized by the Malacca District Government. This is also caused by limited resources, both human resources and other resources. Human resources only have 32 cleaners. The number is divided into drivers, heavy equipment operators, lawn mowers, landfill guards, garbage workers, road sweepers, and road maintenance and sprinklers. Meanwhile, human resources in the field of hygiene that are civil servants only consist of 3 people. In addition, for supporting facilities such as transport cars, there are only 2 units, which are only able to transport up to 3-5 tons of garbage per day. This is not in accordance with the conditions in the field that are not supportive, because the amount of waste production which reaches 20 tons per day is not comparable to the number of waste transportation equipment which is only 2 units.

Garbage disposal in Betun City Malacca Regency is also not balanced with the existing carrying capacity and capacity, so that garbage still accumulates on the roadside, in office areas, schools, beaches and in corners. Betun City Malacca Regency. Waste management system in Betun City Malacca Regency can also be said to still be classified as using traditional concepts, namely the concept of gathering, transporting and throwing away. This system is still being used because there is no better way to manage waste. Piles of garbage on the side of the road will result in road narrowing and cause congestion and cause pollution and disease in the

surrounding community. Garbage that accumulates will cause unpleasant odors and a dirty city view and cause discomfort. Garbage becomes a problem if it is not processed properly and is not utilized.

Waste management problems in Betun City Malacca Regency according to the researcher's observations is also caused by relatively low policy communication, meaning that policy implementers still rarely socialize to the community, either through the sub-district or through the village, while to increase public awareness in managing the waste generated is the need for continuous socialization. continuously in order to be able to open up insight about the importance of a good and correct waste management system which of course aims for environmental hygiene and health, especially in Malacca Regency.

Another problem with waste management in Betun City, Malacca Regency is the unclear details of the tasks carried out by policy implementers so that in handling implementing policies there is a lack of integration between management and retribution, which should work together and support each other, such as the problem of inadequate resources. Therefore, the good or bad performance of public policies will be known if the policy is implemented at the implementation level at the micro level which in this study is the management of waste generated by the community in Betun City Malacca Regency or in other words a public policy must be implemented in order to have the desired impact and goals and public policy will be seen when implemented or applied in the field which in this research is Betun City Malacca Regency.

From this explanation, Nugroho (2006:158) states that policy implementation is a way for a policy to achieve its goals. To implement public policy, there are two choices of steps, namely direct implementation in the form of programs or through formulation of derivative policies or derivatives of these public policies. Meanwhile, according to Soenarko (2005: 180) in implementing public policy there are several provisions that must be met and carried out in order to be successful, these provisions concern the authority of the implementor, the content of the policy, the legitimacy of the people and so on.

Understanding what actually happens after a policy is declared effective or formulated is the focus of attention on policy implementation, namely the events and activities that arise after the implementation of state policy guidelines, which include both efforts to administer it and to cause consequences. real impact on society or events. Policy implementation is actions taken by the government in tangible form, both in the form of programs and decisions about how to achieve the goals or objectives to be achieved, which in this case are the suggestions to be achieved from the policy..

Reality shows that a policy implementation from the start involves a very complex rational and emotional process through the mechanism of political elaboration into routine procedures through bureaucratic budgets, this bureaucracy must be able to run effectively, meaning that it must carry out and implement public policy formulations. public policies) properly to achieve the desired goals and objectives. In the understanding of governance, the community is the main actor of development while the government (bureaucracy) is obliged to direct, guide and create a supportive climate.

No matter how great a policy plan or program is, if it is not realized properly and correctly, the program or policy will be in vain. Policy implementation requires policy implementers who are truly honest, have the appropriate competence, have a high commitment to produce what is the goal and really pay attention to the signs of applicable government regulations. Unfortunately, policy implementation is often used as a means to serve the interests of certain groups, individuals and even party interests. In fact, the implementation of policies is often seen as an activity that requires political content which those who have interests as much as possible try to influence it.

With the description previously mentioned, to analyze the level of success implementation of waste management policies in Betun City, Malacca Regency So the author uses the policy implementation theory model from Merilee S. Grindle (1980:11) which states that the success of policy implementation is influenced by the content of the policy and the policy environment (content of implementation). The basic idea is that after the policy is transformed, the implementation of the policy consisting of the content of the policy includes; (a) the interests affected by the policy, (b) the types of benefits generated, (c) the degree of change desired, (d) the position of the policy maker, (e) who implements the program, (f) the resources deployed. Meanwhile, the Policy Environment (content of implementation) includes; (a) the power, interests and strategies of the actors involved, (b) the characteristics of institutions and authorities, and (c) compliance and responsiveness.

## **2. LITERATURE REVIEW**

### **1. Local Government**

According to The Liang Gie (1994:44) Regional Government is the units of government organizations that are

authorized to organize all local interests of a group that inhabits an area led by the head of the regional government. Regional Government according to Riawan (2009: 197) is: "The government (government) in terms of the meaning is the authoritative direction and administration of the affairs of men/women in a nation state, city, ect.

The government is the most common member unit that has certain responsibilities to maintain the system it covers and a practical monopoly concerning its coercive power (Syafie, 2010:41). It is different with CF Strong in Huda (2012:28) which states that local government is an organization where the right to exercise sovereign or supreme power is placed. Government in a broad sense is something bigger than an agency or group, so Adisasmita (2010:16) states that the government is an institution or institution that organizes and balances the needs of individuals or community groups for public goods and services.

## **2. Public Policy**

Friedrich 1969 in Agustino (2016:16) states that Policy is a series of actions proposed by a person, group, government or a certain environment by showing the obstacles from opportunities to the implementation of the proposed policy in order to achieve certain goals.

Furthermore, Islamy (2004:33-34) defines state policy as what is stated to be done or not done by the government. State policy is the target or goal of government programs. Easton defines state policy as the coercive (legitimate) allocation of values to all members of society.

## **3. Policy Implementation**

Nugroho (2006:158) which states that policy implementation is a way for a policy to achieve its goals. Meanwhile, according to Soenarko (2005: 180) in implementing public policy there are several provisions that must be met and carried out in order to be successful, these provisions concern the authority of the implementor, the content of the policy, the legitimacy of the people and so on.

Implementation in a broad sense is a legal administration tool where various actors, organizations and technical procedures work together to implement policies to achieve the desired impact or goal. James P. Lester and Joseph Stewart 2000 in Agustino (2016:129) While Mazmanian and Sabatier in Agustino (2016:128) explains that implementation is the implementation of basic policy decisions, usually in the form of laws but can also take the form of important executive orders or decisions or decisions of court bodies.

A good understanding of implementation should not only highlight the administrative institutions or agencies responsible for a program and its implementation towards the target group, but also need to pay close attention to the various networks of political, economic and social forces that directly or indirectly affect the behavior involved in the program which ultimately has an impact on the program (Wahab, 2005: 184-185) while Keban (2014: 76) states that an implementation relates to various activities directed at the realization of the program, in this case the administrator manages to organize , interpret and apply the selected policies.

## **4. Policy Implementation Model**

In this study, the authors choose to use the policy implementation model of Merilee S. Grindle (1980:11) which states that the success of policy implementation is influenced by the content of the policy and the policy environment (content of implementation) as the basis for the analysis.

The title of this research is implementation of solid waste service policies in Betun City, Central Malaka District, Malacca Regency. Next, the author will relate the policy implementation model of Merilee S. Grindle (1980:11) with a focus on what is an important discussion in this policy and the locus of this research is the place where this policy is implemented as follows:

### **1. Merilee S. Grindle Model Models**

According to Merilee S. Grindle (1980:11), the success of implementing policies on waste management policies in Betun City, Central Malaka District, Malacca Regency, according to Merilee S. Grindle (1980:11) is influenced by the content of the policy, namely the Malacca District Regulation Number 13 of 2016 and the policy environment (content of implementation). ) which in this case is Malacca Regency.

#### **1. The Content of the Policy Includes**

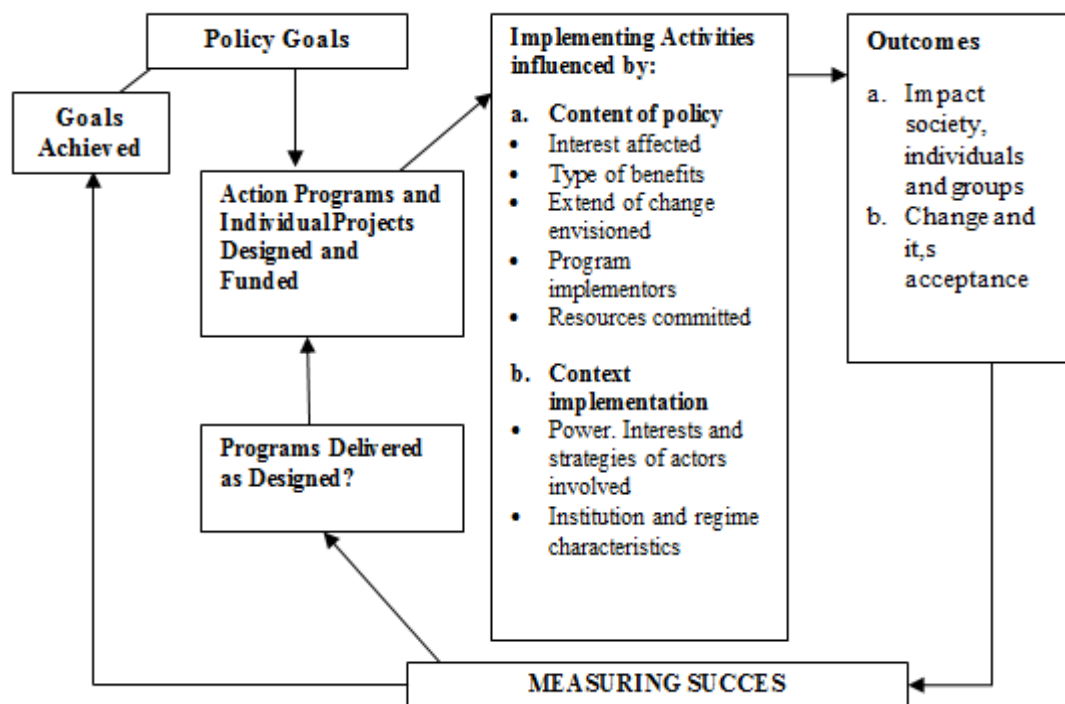
- a. The interests that are affected by the policy in this study are good and correct waste management in Betun City, Central Malaka District, Malacca Regency.
- b. The types of benefits generated in this study are the benefits of waste management policies in Betun City, Central Malaka District, Malacca Regency.

- c. The desired degree of change is the change desired by the district government towards the implementation of waste management policies.
- d. The location of decision making on waste management policies is in Betun City, Central Malaka District, Malacca Regency.
- e. Who is implementing the program? The implementation of the waste management policy in Betun City, Central Malaka District, Malacca Regency was handed over to the Regional Revenue Service and the Malacca District Environment Service.
- f. Resources deployed to deal with waste management problems in Betun City, Central Malaka District, Malacca Regency.

## 2. Meanwhile, the Policy Environment (Content of Implementation) Includes:

- a. The power, interests and strategies of actors involved in implementing waste management in Betun City, Central Malaka District, Malacca Regency.
- b. Characteristics of institutions and authorities in Betun City, Central Malacca District, Malacca Regency.
- c. Community compliance and responsiveness to waste management policies in Betun City, Central Malaka District, Malacca Regency.

**Figure 2.6** Approach Model Implementation as A Political and Administrative Process Grindle 1980



Source: Grindle (1980:11)

## 5. PUBLIC SERVICE

### 6. Waste Management

Gunawan (2007:26) states that waste is basically a material that is wasted or disposed of from a source resulting from human activities or natural processes that have no economic value, it can even have a negative economic value because in handling it either to dispose of or to dispose of. Cleaning it costs a lot of money.

Furthermore, Hadiwiyoto (1983:13) defines waste as the remains of materials that have undergone good treatments because the main part has been taken, or because of processing, or because there are no benefits, which from an economic point of view have no value and from an environmental point of view it can be used. cause pollution or disruption to sustainability.

So far, waste management has been carried out using a collection, transport and disposal system. Garbage originating from the community or the area is only collected in one place, then transported and immediately disposed of at the final waste disposal site (TPA) (Zulkifli, 2014: 106). In this process, the sanitary landfill method is used, namely by storing waste in the ground known as the 4Rs, including:



1. Reduce (reducing), namely trying to minimize the goods or materials we use.
2. Reuse (reuse), that is, choose items that can be reused, avoid using disposable items (disposable).
3. Recycle (recycling), namely goods that are no longer useful can be recycled so that they are useful and have added value. Not all goods can be recycled, but now there are many formal industries and home industries that use waste into useful goods and have economic value.
4. Replace(replace), namely replacing items that can only be used once with more durable items. In addition, using items that are more environmentally friendly, such as replacing plastic bags with baskets when shopping, and avoiding the use of styrofoam because these two materials cannot be degraded naturally.

### **3. METHOD**

This research will be carried out from August to September 2021 in Betun City, Central Malacca District, Malacca Regency. By setting time and location by the author is expected to complete this research by obtaining objective and comprehensive research results.

The method used in research on implementation of waste management policies in Betun City, Central Malacca District, Malacca Regency this is a qualitative research method, with a case study approach. The unit of analysis in case studies can be multiple cases (multi-site studies) or single cases (in-site studies) (Creswell, 2016: 135-136).

Informants in this study amounted to 23 people with the following details:

1. Head Malacca District Revenue Service 1 person
2. Head of the Malacca Regency Environmental Service 1 person
3. Central Malacca Camat 1 person
4. 5 people retribution collector
5. Garbage truck driver 5 people
6. Yellow squad 5 people
7. Community 20 people

The types of data in this study are qualitative data and quantitative data, while the data sources in this study come from primary data sources and secondary data, while the data collection methods in this study are field research, library research, while data collection techniques in this study are This research is observation, qualitative interview and qualitative documents.

In analyzing the data, the data obtained by the researcher used the data analysis technique proposed by Bungin (2012:70), which is as follows:

#### **1. Data Collection (Data Collection)**

Data collection is an integral part of data analysis activities. Data collection activities in this study were using interviews and documentation studies.

#### **2. Data Reduction (Data Reduction)**

Data reduction is defined as the selection process, focusing on simplification and transformation of rough data that emerges from written notes in the field. Reduction is carried out since data collection begins by making summaries, coding, tracing themes, making clusters, writing memos and so on with the aim of eliminating irrelevant data/information.

#### **3. Data Display**

Display data is a description of a set of structured information that provides the possibility of drawing conclusions and taking action. The presentation of qualitative data is presented in the form of narrative text. The presentation can also be in the form of matrices, diagrams, tables and charts.

#### **4. Conclusion Drawing and Verification**

Is the final activity of data analysis. Drawing conclusions in the form of interpretation activities, namely finding the meaning of the data that has been presented.

#### **4. Research Results and Discussion**

##### **4.1 Implementation of Waste Management Policies in Betun City, Central Malacca District, Malacca Regency**

Grindle (1980:10) states that in a policy implementation process what is assessed is the design of an action program to influence implementation activities which can later produce the desired impact on society or individuals so that from the design and program actions are formulated to be implemented until the achievement of a goal of a process. implementation. With reference to the research question, to analyze the implementation of waste management policies in Betun City, Central Malacca District, Malacca Regency then the author uses the policy implementation model of implementation of policies from Merilee S. Grindle (1980:11) and associated with the findings of the data, interviews and observations of the author which will be discussed further through the discussion below:

### 1. Contents Of Policy (Content of Policy)

Regarding the content of the policy regarding the implementation of the waste management policy in Betun City, Central Malacca District, Malacca Regency, the results of the research and discussion can be described as follows:

#### a. Interests Affected By Policy

as well as the provision of a final disposal location, it is known that the interests that the policy wants to influence are the habits of the people of Betun City as the center of the capital city of Malacca Regency who are less orderly in disposing of waste in its place to be orderly in disposing of waste and in its implementation it is known that the largest amount of waste generation is in Malacca Regency. is in the District of Central Malacca, namely Kota Betun as the locus of this research. This will be described in the following table:

**Table 4.1** Total Waste Generation in 4 Districts in Malacca District

Garbage in West Malacca District			
Year	2019	2020	2021
Total Waste Generation (Tons/Year)	6732	7263	7351
Garbage in Central Malacca District/Betun City			
Year	2019	2020	2021
Total Waste Generation (Tons/Year)	7904	8033	9098
Garbage in the District of Kobalima			
Year	2019	2020	2021
Total Waste Generation (Tons/Year)	7077	7263	7372
Garbage in East Malacca District			
Year	2019	2020	2021
Total Waste Generation (Tons/Year)	5745	7379	7780

**Source:** Malacca District Environmental Service, 2022

In the table, it is known that Betun City, which is located in Central Malacca District, has the largest amount of waste generation in Malacca Regency which in 2021 amounted to 9098 Tons/Year.

This finding related to the generation of large amounts of waste is a rational finding because Betun City is the area with the largest population of people in Malacca Regency, which is 35,869 people and is the capital of Malacca Regency so that all community activities are centered on this City and will directly impact on the amount of generation generated. generated waste.

The largest amount of waste generated in Betun City is in the market area, so if it is related to the interests affected by the policy, the author can state that this has not been effective where from 2019 to 2021 there has been a significant increase in the amount of waste disposal in Betun City.

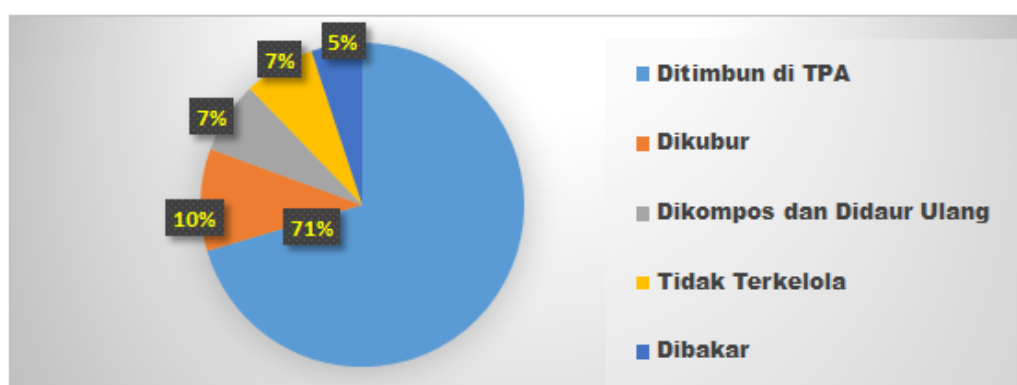
#### b. Types of Benefits Produced

Type of benefit, namely the type of benefit received by the target group. In policy content, the type of benefits as mentioned by Grindle (1980) aims to show or explain that in a policy there must be several types of benefits that show the positive impact generated by the implementation of the implemented policies.

Based on the results of interviews conducted by the author, it is known that the types of benefits resulting from the waste management policy of the Malacca District Regulation Number 13 of 2016 concerning Public Service Retribution are the most important in a healthy and clean environment. Kota Betun is to increase regional income from levies collected in return for cleaning services and waste management which includes taking waste from the source, transporting waste from TPS to TPA, as well as providing final disposal sites.

But in fact, the coverage of solid waste services in Malacca Regency is still minimal, both in urban and rural areas. This is not only caused by the low level of Clean and Healthy Living Behavior (PHBS), but also because of the availability of waste facilities and infrastructure, namely the lack of transportation fleets, the lack of TPS and the 3R concept of household waste management has not been implemented. With these various limitations, it is planned that the waste service coverage of 50%-100% for urban areas is estimated to only be achieved until 2022.

The types of waste management in Betun City will be illustrated in the following diagram:



**Figure 4.1** Ways of Waste Management in Betun City

*Source:* Malacca District Environmental Service, 2022

Referring to the results of the research above, according to Grindle (1980), the type of benefits to be generated aims to show or explain that in a policy there must be several types of benefits that show the positive impact generated by the implementation of the implemented policies. This is necessary in order to have an impact, although the effect is often positive or negative. Therefore, it is assumed that if the policy environment in this case is the government and the people who inhabit the City of Betun have a positive view of the benefits to be generated by the waste management policy through the Malacca District Regulation Number 13 of 2016 concerning Public Service Retribution, it is a healthy environment and clean.

In its implementation in Betun City, the behavior of the community in managing waste that is still not environmentally friendly has become an entrenched lifestyle, most of the waste is simply dumped into ditches/streams, disposed of carelessly, piled up in TPS/TPA, burned or piled up. The most common way of disposing of waste in Kota Betun by households is to burn it without collecting it for recycling. This is in contrast to the government's goal to produce a healthy and clean environment.

### c. Desired Degree of Change

The degree of desired change, namely the extent to which changes are desired from the existence of a policy. The degree of change to be achieved shows how much change you want or want to achieve through the implementation of a policy that must have a clear scale.

Based on the results of interviews and observations of the author, it is known that the desired degree of change from the implementation of waste management policies through the Malacca District Regulation Number 13 of 2016 concerning Public Service Retribution has not been implemented because the behavior pattern of the community is not fully aware of the adverse effects of the behavior pattern of littering while Not all waste produced by the people of Kota Betun can be recycled naturally, such as plastic, metal/metal and glass.

This also happened because according to data from the Malacca District Public Works Agency that as many as 81% of the Malacca Regency community did not experience waste management services, even though the amount of waste generated was increasing along with the increase in population. Apart from that, in terms of the fleet of waste transporters, there is still a shortage, so that some waste cannot be transported. In addition, the number of TPS facilities is inadequate and the available TPS facilities are not feasible. In addition, the community is not yet willing to provide land for the construction/placement of TPS and this finding needs

special attention because in collecting waste in Betun City, the Malacca District Environmental Service is faced with problems with facilities and infrastructure such as garbage bins, garbage trucks and wheelbarrows to carry out transportation in the city of Betun. each waste location to the TPS.

The composition of the types of waste in Betun City will be described in the following table:

**Table 4.2** Composition of Waste Types in Betun City

No.	Garbage Components	Weight percent (%)
1.	Organic (food scraps, leaves, etc.)	98.19
2.	Plastic	0.58
3.	Paper	0.58
4.	Metal/Metal	0.11
5.	Rubber	0.08
6.	Cloth	0.03
7.	Glass	0.02
8.	Etc	0.41
<b>Total</b>		<b>100</b>

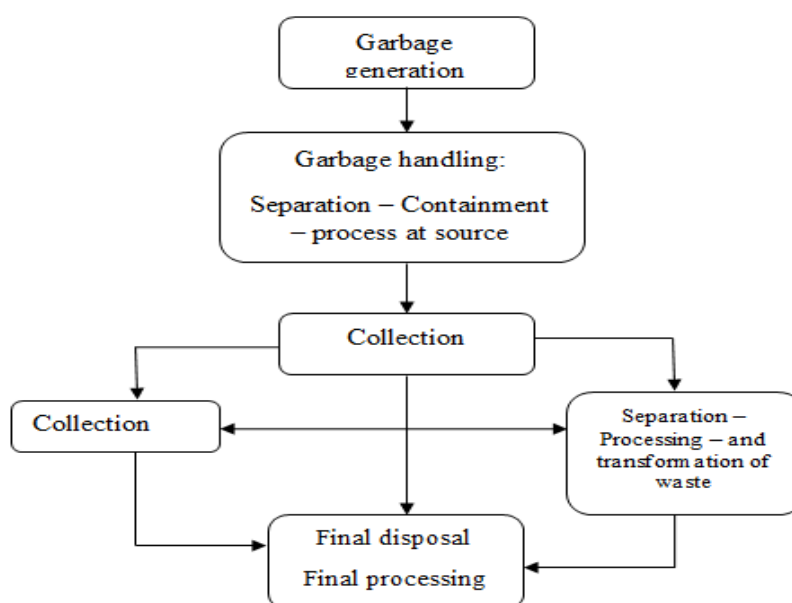
*Source:* Malacca District Environmental Service, 2022

#### d. Location of Decision Making

Place decision making. Whether the location of a policy is correct or not. Making a decision in a policy plays an important role in the implementation of a policy, therefore in this section it must be explained where the decision making of a policy that will be implemented is located.

The decision making to produce this policy is based on bottom-up decision making where the issues that exist in the community in Malacca Regency related to the waste problem are included in the policy agenda, then this policy is formulated and this policy is born with the hope that in its implementation this policy can change the Malacca Regency, especially the City. Betun becomes cleaner.

Based on the above process stages, schematically the directions for handling Distrto Dili waste can be described as follows:



**Figure 4.2** Schematic of Waste Management Operational Techniques in Malacca District

Based on the results of interviews with the author, it is known that the decision making to implement the waste management policy is correct. Most of the people answered that the existence of the waste management policy that was implemented was appropriate to answer the waste problem in Betun City but was still lacking in the implementation stage where the waste problem was still the main problem in Betun City as the largest waste producer in Malacca Regency. Gridle's (1970) statement about the degree of decision making is in line with the statement Water William in Islamy (2004:132) states that the most important problem in policy implementation

is to transfer a decision into an activity or operation in a certain way and that way is that what is done has a common sense of reason with the decision and functions well within the scope of the institution.

#### e. Who is the Program Implementer

According to Grindle (1970), in carrying out policies, of course there will be program implementers that are integrated from one field to another. Where the program implementers will have a role in carrying out policies. The party fully involved in the implementation of public policy is the bureaucracy as described by Ripley and Franklin in Tachjan (2006:27):

"Bureaucracies are dominant in the implementation of programs and policies and have varying degrees of importance in other stages of the policy process. In policy and program formulation and legitimacy activities, bureaucratic units play a large role, although they are not dominant".

In this way, bureaucratic units occupy a dominant position in policy implementation, which is different from the stage of formulation and determination of public policies where the bureaucracy has a large but not dominant role.

Every government policy implementation certainly has a policy implementer in its implementation, including in waste management in Betun City. The roles of each party are that the Malacca District Government is the party that takes the initiative (initiator) so that the waste management policy becomes a community movement and gives responsibility to the Malacca District Environmental Service to take care of waste management problems while for its implementation at the lowest level, namely directly dealing with the community as the target of the policy is handed over to the garbage collectors. In line with the resources deployed in the results of the author's research, Dimock & Dimock in Tachjan (2006:28) state that the implementing element is the policy implementor which is explained as follows:

"Policy implementers are those who carry out policies which consist of determining organizational goals and objectives, analysis and formulation of organizational policies and strategies, decision making, planning, programming, organizing, mobilizing people, operational implementation, monitoring and assessment".

#### f. Deployed Resources

The implementation of a policy must also be supported by adequate resources with the aim that its implementation can run well. The resources involved in the task of implementing the policy are an important factor. The existence of these resources serves as an executor who moves, manages, and supports policies in order to achieve success. According to Widodo (2011: 98) the resources as already mentioned include human resources, financial resources, and equipment resources (buildings, equipment, land and other spare parts) needed in implementing policies.

Based on the results of interviews and observations made by the author, it is known that the waste management policy in Betun City in its implementation is constrained by budget, human resources and inadequate waste management infrastructure. The total waste carrying capacity in Dili City will be illustrated in the following table:

**Table 4.3** Waste Transport Capacity in Kota Betun in 2021

No	Transported Volume (M3)												
1.	Month	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sep	Oct	Nov	Des
2.	Load	2000	1850	1700	2550	2010	3234	2002	2601	1900	2222	2322	1985
3.	Amount	25342					53.52%						

**Source:** Malacca District Environment Agency, 2022.

In table 1.2 above it is known that the amount of waste transportation in Betun City in 2021 is still low and has not reached the government's target of 98%, the amount of transported waste only reaches 53.52% that is transported, while 46.48% of waste in Betun City does not. transported. This phenomenon is still a major problem in the City of Betun even since this policy was initiated and implemented in 2016. It is also known that the City of Betun does not yet have an adequate Final Disposal Site.

#### 2. Policy Environment (Content of Implementation)

In Grindle's (1980:10) explanation, Clearly, then, the content of public programs and policies is an important factor in determining the outcome of implementation initiatives, policy or program content is often a critical

factor because of the real or potential impact it may have on a given social, political, and economic setting (that the content of programs and public policies is an important factor in determining the results of implementation initiatives, so it is necessary to consider the context or environment in which administrative actions are carried out, because implementation is a continuous process in making decisions that are involving multiple actors).

#### **A. Powers, Interests and Strategies of Involved Actors**

The success of the policy can then be measured through the policy context, one of which is looking at the power, interests, and strategies of the actors involved. Because before a policy is made, of course it goes through a long process, and this process goes through several doors of interest from the executive and legislature. These powerful institutions then have the right to ratify a policy.

Based on the results of these interviews and combined with the results of the author's observations, it is known that in terms of power, the actors involved are only a description of the highest power, namely the Regent of Malacca for the benefit of creating a clean and trash-free Betun City. This is in accordance with Woodrow Wilson's statement in (Sedarmayanti, 2010: 68) which states that the estuary of bureaucratic reform is optimizing the infiltration of political interests in the administrative realm, which is the land for the bureaucracy to carry out its main task, namely implementing policies. That is, the political process is enough to occur at the time of policy formulation until the policy is agreed upon.

As for the strategy owned by the actors involved in implementing the waste management policy in Betun City, it is guided by the Malacca District Regulation Number 13 of 2016 concerning Public Service Retribution as a reward for cleaning services and waste management which includes taking waste from the source, transporting it. waste from TPS to TPA, as well as the provision of a final disposal location with the same main goal, namely a clean and waste-free environment. This is in line with Weber's view in Rakhmat (2009: 69) which discusses bureaucracy within the framework of the concept of authority and domination. This concept looks at the power relationship which concerns the ability of the person in power to impose his will on the person being controlled. One of the dominance that is meant is rational illegal,

#### **B. Characteristics of Institutions and Rulers**

Characteristics of institutions and rulers, namely how the existence of institutions and regimes that are in power. The implementation of a program can create conflict for those whose interests are affected. The conflict resolution strategy regarding "who gets what" can be an indirect indication of the characteristics of the authorities or institutions that implement the program, both regarding the alignments of the implementing agency authorities and their authoritarian or democratic leadership styles.

The environment in which a policy is implemented also has an influence on its success, so in this section it is explained how the characteristics of an institution will also influence a policy.

Characteristics of good institutions and authorities for the implementation of waste management policies in Betun City are not only needed by the Malacca District Environmental Service but also the people of Betun City itself. The Malacca Regency Government as the local governing body should provide a means for the community to submit all complaints related to the waste problem.

From the results of these interviews and the results of in-depth observations of the authors, it is known that the characteristics of institutions and authorities in the City of Betun in implementing waste management policies have had a considerable influence on the implementation of this policy.

Grindle's (1980) statement about the characteristics of ruling institutions is in line with the opinion of Van Meter with Van Horn (1975:470) which states that one of the variables that influence public policy is the characteristics of implementing agents. Associated with the characteristics of policy implementers in the implementation of waste management in Betun City is that in order for policy implementation to run successfully, program implementers must get support from upper-level policy elites, from lower-level policy implementers as well as support from the community as the subject of development and at the same time as beneficiaries of development,

Based on this description, it can be assumed that the program implementers are the leaders or leaders for the programs they carry out or assigned to them, so that the program implementers must have government leadership abilities or skills. This is in accordance with the opinion of Wasistiono (2010: 8) which states that the variables for choosing government leaders so that they are able to carry out leadership well, one of which is: Compatibility, is a description of the ability of government leaders to adapt to policies that come from the government system at the top level and the ability to accommodate the demands of the lower levels of government subsystems as well as from their followers. Referring to the opinion of Wasistiono (2010:

Based on this and related to the results of the study, it can be stated that the characteristics of institutions and authorities in implementing waste management policies in Betun City tend to be compatible where the leader of waste management activities or in this case is the Malacca District Environmental Service can adapt to policies that come from the government system at the top level and be able to accommodate demands from the government subsystem. lower levels as well as from his followers in other words tend to be democratic and not authoritarian.

The Malacca District Environmental Service receives support from political elites or rulers in Malacca District and always builds good emotional relationships with the community in the market area, housing, schools and offices and shops, but has not been able to build good communication with the community through the provision of facilities. infrastructure, adequate human resources and facilities for submitting complaints about waste management in Betun City. This happens because this problem is a decision at the top level, namely the Malacca District Government while the Malacca District Environmental Service is only an implementing agency for policies at the lower level and not the ruler at the top level.

### **C. Compliance and Responsiveness of Implementing Agencies**

Merille S Grindle argues that the last indicator in a policy implementation is determined from the extent of compliance and the response of the implementer to respond to a policy. Compliance and responsiveness or response from implementers are also considered to be an important aspect in the process of implementing a policy, so what will be explained at this point is the extent to which compliance and response from implementers in responding to a policy, Grindle in Agustino (2008:156).

It can be understood that the compliance and responsiveness of implementing actors in implementing waste management policies in Betun City are the officials of the Malacca District Environmental Service. In its implementation, the implementing agencies of waste management policies in Betun City are ready and obedient to succeed in the leadership's orders, it's just that various weaknesses still accompany the journey of the policy. Is it inadequate facilities, as well as substandard welfare. This, among other things, affects the implementation of this policy.

Based on this, the authors state that the compliance and response of policy implementers greatly influences the success of implementing waste management policies as Van Mater and Van Horn say in Agustino (2008:143) that the attitude and acceptance or rejection of implementing (agents) will be very large. affect the success or failure of the performance of public policy implementation. This is very likely to happen because the policies implemented are not the result of the formulation of local residents who are well acquainted with the problems and problems they feel. However, the policy that will be implemented by the implementer is a (top down) policy where it is very possible that the decision makers will never know (not even be able to touch) the needs, desires, or problems that residents want to solve.

Another aspect that affects the compliance and responsiveness of implementing waste management policies in Betun City is the lack of rewards for policy implementers who have carried out their duties beyond what is expected by the organization or executor who excels, such as providing income improvement allowances that are adjusted to the workload of the employees. the implementor where this can stimulate the achievement of better waste management tasks for these outstanding implementers and their colleagues, and in the end can increase the capability of the Malacca District Environmental Service organization.

### **4.2 Inhibiting Factors in the Implementation of Waste Management Policies in Betun City, Central Malacca District, Malacca Regency**

Waste management as an aspect of development has an important function in supporting the level of community welfare, because it is related to health, lifestyle, environmental conditions of settlements and comfort in daily life. Waste management is often considered a "backward" business, so that it is often marginalized from other affairs, but along with the demands for increasing people's quality of life standards, and the increasing level of environmental pollution and the limited carrying capacity of the environment itself causes waste management to be wrong. one aspect of development that must be considered.

It is still often found that the development aspects of solid waste management are still running independently without any integrated coordination. Bad waste management in an area certainly has its own inhibiting factors, so based on this, the author will describe the inhibiting factors for implementing waste management policies in Betun City which consist of internal and external factors as follows:

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## 1. INTERNAL FACTORS

### a. Human Resources

Human resources are the most important factor in waste management in Betun City. All efforts to improve waste management cannot be separated from the aspect of human resources. The technical, managerial and operational capabilities of waste management actors are the main and absolute requirements for better waste management.

The limited quality and low quantity of employees are still a problem related to waste management in Betun City, causing waste management in Betun City to be still not effective and efficient. Betun City has an area of 168.69 square kilometers with a population of 35,869 people but the number of resources in waste management in the field is only 37 people to take care of this large area with a large population. Therefore, the author can state that human resources in waste management in Betun City are one of the internal inhibiting factors for the ineffectiveness of this policy.

### b. Facilities and infrastructure

Limited facilities and infrastructure are also an internal inhibiting factor for waste management policies in Betun City. with the increasing volume of waste in the City of Betun every year but not in line with the provision of facilities and infrastructure that support waste management activities. The Malacca Regency Government has not provided infrastructure in the form of garbage bins in every corner of Betun City. The inhibiting factor related to facilities and infrastructure is the availability of garbage trucks. The local government only has 3 units of trucks for transporting waste in Betun City, working days are every day including Saturday and Sunday, but due to the lack of facilities in the form of garbage trucks, the capacity of transporting waste from Temporary Disposal Sites to Final Disposal Sites (TPA) only reaches 3 .60 million m<sup>3</sup> and the rest is waste that is not transported.

### c. Legal Suppression Not Maximum

The economic growth of the people of Betun City from year to year is increasing, followed by population growth. This is increasingly felt its impact on the environment, namely humans tend to damage the environment in order to maintain their lives. The quality of the environment is continuously decreasing, causing environmental degradation problems in people's lives. One of the environmental problems that is still problematic in Betun City is waste management, therefore law enforcement is needed in its implementation.

Until now, the sanctions contained in the regulations, especially those regarding waste management, do not provide a deterrent effect for the people of Kota Betun who do not carry out waste management with an environmental perspective, so it is necessary to study the effectiveness of sanctions in law enforcement of this waste management policy. In addition, the role of local governments is also very important in issuing policies related to sanctions against irresponsible waste management. If the region is able to manage its waste properly, then the implementation of the principles of Good Environmental Governance can be said to be fulfilled.

## 2. External Factors

### a. Waste Production That Always Increases Every Year

With the stipulation of Betun City as the capital of Malacca Regency, automatically all the activities of the people of Malacca Regency will be largely concentrated and concentrated in Betun City. This activity, which is centered in the City of Betun, is also the cause of the increase in the volume of waste produced every year because the population of the community is increasing and the community is the main producer of the waste itself.

It should be noted that the population growth of Betun City every year continues to increase. In 2018, the population in this city was 189,220 people, increased in 2019 to 191,892 people then increased again in 2020 to 196,796 people. This increasing population is directly proportional to the total amount of waste produced and as a result, waste that is not managed properly will cause various problems from an aesthetic point of view, this can be seen from the piles of garbage in landfills (TPS) and markets. This waste problem can also have an impact on public health such as skin diseases, respiratory problems and potential environmental disasters caused by the activities and consumption of the community itself.

### b. Betun City Public Awareness is Still Low on Proper Waste Management

The people of Betun City view that dealing with the waste problem is the full responsibility of the government alone. The community plays a role only as a party who wants to be served because people think that the Malacca Regency Government through the Malacca Regency Environmental Service already has a policy for city cleanliness so that people don't feel they are responsible for the waste problem.



### c. Waste Management for Recycling is Still Low

In urban communities, there is a consumptive culture that influences the improvement of the quality and types of waste, including the people of Kota Betun, which is the capital of Malacca Regency. The increasing volume of waste from year to year in Betun City is a strong reason that the waste problem is a major problem that must be solved in the short, medium and long term.

Various efforts have been made by the Malacca Regency Government to handle waste, including providing a budget for operational costs and waste management infrastructure. The budget is allocated for the management of the Final Disposal Site (TPA) for waste and infrastructure for managing waste. However, the waste problem is still a serious enough problem to be handled because the amount of waste generated in the City of Betun continues to increase every year. This is because the TPA has limited storage facilities. Currently, almost all waste ends up in the TPA so that the burden of the TPA becomes very heavy and this requires a large area of land and relatively expensive environmental protection facilities.

So far, waste management has not been in accordance with environmentally sound waste management methods. Most of the landfill waste management in Malacca Regency uses the open dumping and landfill methods. The open dumping method is the simplest method, waste is simply disposed of in the TPA without further treatment, while the landfill method is that the waste is leveled and compacted with heavy equipment and covered with soil. Both methods are less environmentally friendly because of the potential for contamination of ground water and air pollution. However, there are also other methods, namely composting, incineration, sorting, but for recycling waste processing, it is not widely used in Betun City so that it contributes to the still ineffective waste management policy in Betun City.

## 5. CONCLUSION

Based on the description of the background, literature review as well as the results of research and discussion that have been discussed in the previous chapter regarding the Implementation of Waste Management Policies in Indonesia Betun City, Central Malacca District, Malacca Regency the conclusions that can be drawn in this paper are:

1. Implementation of waste management policies in Betun City, Central Malacca District, Malacca Regency use The theoretical model of policy implementation from Merilee S. Grindle (1980:11) which states that the success of policy implementation is influenced by the content of policy which results in the following conclusions; (a) the interests of actors involved in implementing waste management policies have not been affected by waste management policies in Betun City, (b) types of benefits to be generated from policy implementation waste management in Betun City is a healthy and clean environment but its implementation has not been effective due to community habits, limited facilities and infrastructure and inadequate human resources (c) while for the implementation at the lowest level, namely those who directly deal with the community as the policy target, it is left to the waste transporters (f) the resources deployed are human, financial and infrastructure resources but are not sufficient to support waste management policies in Betun City. Conclusions that can be drawn from the policy environment (content of implementation) is (a) the interests affected by the policy are the creation of a clean and free of waste Betun City, (b) the characteristics of institutions and authorities in Malacca Regency in implementing waste management policies in Betun City tend to be democratic and not authoritarian but have not been open and have not been able to build good communication with the community through the provision of means of submitting complaints, (c) compliance and responsiveness of implementing actors in its implementation, the implementing agents of waste management policies in Betun City are ready and obedient to succeed the leadership's orders, it's just that various weaknesses still accompany the journey of this policy. Is it inadequate facilities, as well as substandard welfare. This has influenced the implementation of this policy.
2. The inhibiting factors for waste management in Betun City, Central Malaka District, Malacca Regency consist of internal factors, namely; (a) limited human resources in terms of quality and quantity of employees (b) limited facilities and infrastructure where the increasing volume of waste in Kota Betun every year does not go hand in hand with the provision of facilities and infrastructure that support waste management activities and (c) enforcement the law has not been maximized, namely until now, the sanctions contained in the regulations, especially those regarding waste management do not provide a deterrent effect for the people of Betun City, while for external factors, namely; (a) the production of waste that always increases every year.

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## IOT DEVICES IN HEALTH MONITORING

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## ABSTARCT

One of the most crucial aspects of our lives is our health. A lot of people don't know they have a health issue like high blood pressure, heart problems, stress, etc. It should be addressed properly, otherwise it will cause major health issues like cardiac arrest and serious brain injury, so monitoring our health and taking action when it is out of control is the best way. This paper will discuss IoT devices and how we can monitor our health using different IoT (Internet of Things) devices and sensors and comparison of the different works done by others.

**Keywords:** *IoT, sensors, health monitor, Heartbeat, Blood pressure, Body Temperature*

## INTRODUCTION

Health is a major concern in our day-to-day lives. These days, due to heavy work pressure, unhealthy food and busy schedules, compromised sleep cycles, a lot of people are facing health issues which they don't know about. These are also small issues that we ignore which lead to serious health problems in the future. Monitoring our health daily and tracking that will help us take action on our health when it is out of control, but going to the hospital repeatedly and spending a lot of money on testing blood pressure, heart rate, stress and oxygen level is not feasible.

IoT (Internet of Things) brings a solution to this problem. We can use different sensors like temperature sensors, blood pressure sensors, heart beat sensors, and GSR sensors to track health, and this data can be stored in the cloud and analysed using AI and machine learning technology, so we can get health reports through smart phones. Simple health monitor using smart watch is shown in below fig. 1



**Figure 1.** Health Monitoring using smart watch

## RELATED WORKS

Author [1] created a health monitoring system that monitors heart rate and body temperature using various IoT devices. A heartbeat monitoring sensor is used to monitor the heartbeat. The heart beat sensors are based on plethysmography principle. Using plethysmography principle we can measure the change in volume of the blood. The pulses timing also important in the heart beat track system. When heart pumps blood there is change in volume of blood, through this change of volume heart beat is tracked. To monitor body temperature, the author used the LM35 sensor. The sensors are connected through ESP32 module and data collected from sensors are analyzed.

The NodeMCU, ESP8266, and MAX30100 sensors were used by the author [2]. MAX30100 can provide both SpO2 and heart beat data. The MAX30100 sensor is a biosensor module comes with both pulse oximeter and heart beat monitoring. It operates on 1.8 Volt low power supply and 3.3 Volt for the LEDs. The tiny physiological sensor contains an IR or red LED, photo detector or photodiodes, LED driver, digital noise cancellations, ambient light rejection, and data FIFO. For SpO2, the MAX30100 sensor gives a collection of data that includes IR and RED LED data. A photoplethysmography (PPG) signal refers to this information. This sensor comes with a datasheet that includes reference ranges for healthy and harmful conditions. As a result, total 5 healthy people are considered for collection of data and system validation process. The information gathered will be compared with the Health Regulation and datasheet reference.

The author [3] used DS18B20 and MPX5050DP sensors. DS18B20 is a sensor used to check the temperature of the body and MPX5050DP is a blood pressure sensor. The main controller is the Arduino. The nodeMCU module is used for data processing and data transfer. Smart phones and LCD is used for display. The DS18B20 detects a person's body temperature by connecting the sensors to the tip of their finger. Sensor provides data to Arduino module in pulse signals form and the unit is degrees Celsius (0 C). MPX5050DP uses the air pressure from the shackle to monitor someone's blood pressure, producing analogue data that can be accessed via the Arduino analogue ports. The analogue data is then transformed to digital data format in the node MCU. It serves as a processor for sending data to a server. The collected data is first authenticated then transferred. Authentication results in wireless transmission of body temperature data and blood pressure data to the servers, which is presented on the Liquid Crystal Display or via an Android app.

The author [4] used the MAX30100 sensor for measuring oxygen level in blood, the BMP180 sensor for measuring blood pressure, the LM35 sensor for measuring temperature of human body, the INA219 sensor for measuring glucose level in blood, and the Heart beat sensor for measuring ECG and heart beat. These sensors collect data, which is subsequently processed by the Arduino, then displayed on a LED display and with the help of NodeMCU values are saved in a database built with Firebase. The values saved in database can be accessed from

the different applications for different use cases. When the device is turned on, it first determines which sensors are active, and then, if an input is provided, it generates an output based on the active sensors. If the sensor LM35 is enabled and given an input, the output is the user's body temperature, same way other sensors also works. However, because only one input is sent to a sensor at a time, the output will be given one by one rather than all at once.

The author [5] used the MPX5050DP sensor to measure blood pressure and nodeMCU to upload data to firebase and compared the data with the actual BP monitoring system used in hospitals.

The author [6] used the LM-35 sensor to measure the temperature and MAX30105 sensor which detects cardiac pulses to generate ECG data and aids in the determination of oxygen levels in the blood. An Arduino is used to link all of the sensors. A server (ThingSpeak) and a web app are used to create a link between the patient and the doctor. The Arduino is attached to the Wi-Fi module (ESP8266), allowing sensors data to be stored from the IoT interface over the local internet. All sensors are connected using the programmed Arduino Mega 2560 microcontroller. The power is provided by an adaptor or a battery. A charge controller is used to regulate voltage.

## RESULT COMPARISON

### Heart Beat:

Subjects	Actual data (bpm)	Observed data (bpm)	Error (%)
S <sub>1</sub>	67	68	1.49
S <sub>2</sub>	70	73	4.28
S <sub>3</sub>	74	77	4.05
S <sub>4</sub>	75	73	2.66
S <sub>5</sub>	73	72	1.36
S <sub>6</sub>	80	83	3.75

**Table 1.1** Author [1] results

Heart rate (%)
1.03
1.03
1.02
1.02
1.02

**Table 1.2** Author [2] results

Serial No.	Heartbeat value from Project device	Heartbeat value from Conventional Way (Digital Smart Watch)	% of Error
1	55	63	12.69
2	72	69	4.16
3	61	55	9.83

**Table 1.3** Author [4] results

Time (Hours)	Standard Heart Rate (bpm)	Measured Heart Rate (bpm)
7:00 AM	60	74
1:00 PM	70	74
7:00 PM	80	81
1:00 AM	90	93

Table 1.4 Author [6] results

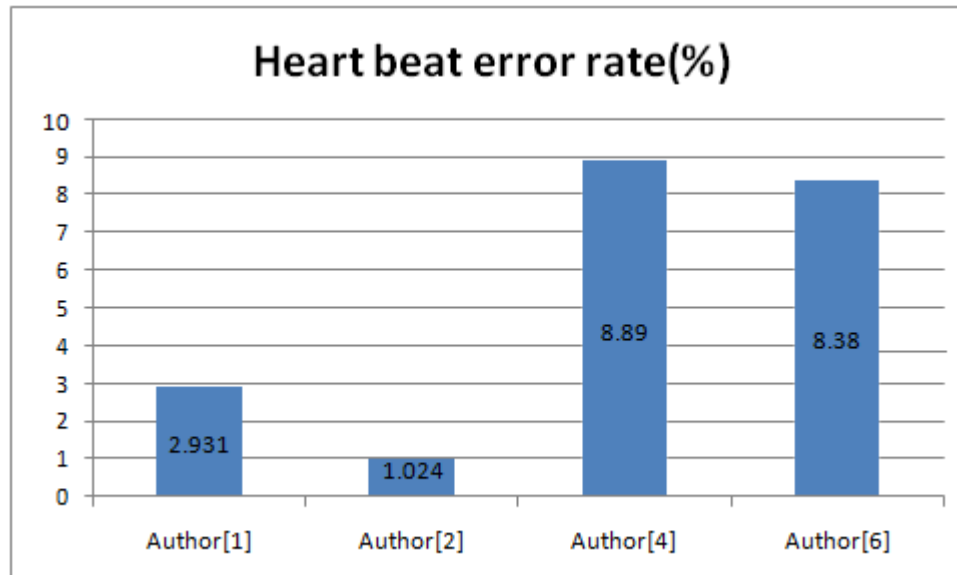


Figure 2. Heart beat error rate comparison

**Blood Pressure:**

Id_Patient	Age	Blood Pressure (mmHg)		Average Relative Error
		Measurement I	Measurement II	
001	34	1 %	0.9 %	0.95 %
002	21	0.3 %	0.3 %	0.3 %
003	29	1 %	0.5 %	0.75 %
004	24	2 %	1 %	1.5 %
005	16	0.9 %	0.2 %	1.8 %
006	22	1.5 %	1.5 %	1.5 %
Average relative error				1.13 %

Table 2.1 Author[3] results

Serial No.	Diastolic Blood Pressure value from Project Device (in mmHG)	Diastolic Blood Pressure value from Sphygmomanometer (in mmHG)	% of Error
1	74	85	12.94
2	75	84	10.71
3	78	87	10.34

Table 2.2 Author [4] results

R- Factor		Error Relative (%)	
Systolic	Diastolic	Systolic	Diastolic
1.39	1.5	3.83	2

Table 2.3 Author[5] results

Time (Hours)	Standard Blood Pressure (mmHg)		Measured Blood Pressure (mmHg)	
	Systolic	Diastolic	Systolic	Diastolic
7:00 AM	120	80	114	75
1:00 PM			128	66
7:00 PM			114	65
1:00 AM			126	73

Table 2.4 Author [6] results

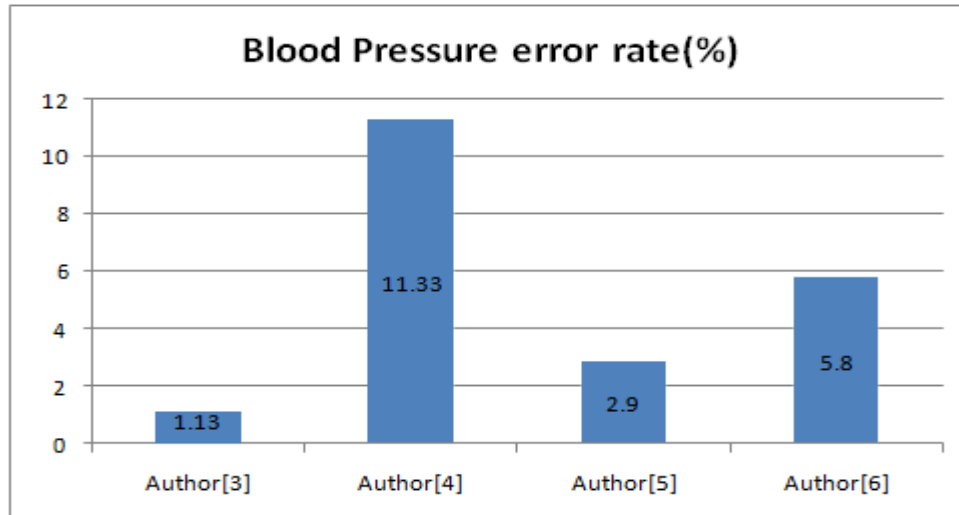


Figure 3. Blood pressure error rate comparison

#### Body Temperature:

Subjects	Actual data (°F)	Observed data (°F)	Error (%)
S <sub>1</sub>	97.3	97.8	0.51
S <sub>2</sub>	98.4	97.7	0.71
S <sub>3</sub>	98.1	98.6	0.50
S <sub>4</sub>	96.9	97.5	0.62
S <sub>5</sub>	97.5	97.1	0.41
S <sub>6</sub>	98.2	97.0	0.81

Table 3.1 Author [1] results

Id_Patient	Age	Body Temperature (°C)		Average Relative Error
		Measurement I	Measurement II	
001	34	2 %	0.5 %	1.25 %
002	21	0.2 %	0 %	0.1 %
003	29	0.1 %	0.1 %	0.1 %
004	24	0.6 %	0.3 %	0.45 %
005	16	0.3 %	1.3 %	0.8 %
006	22	0.2 %	0.5 %	0.35 %
Average relative error				0.5 %

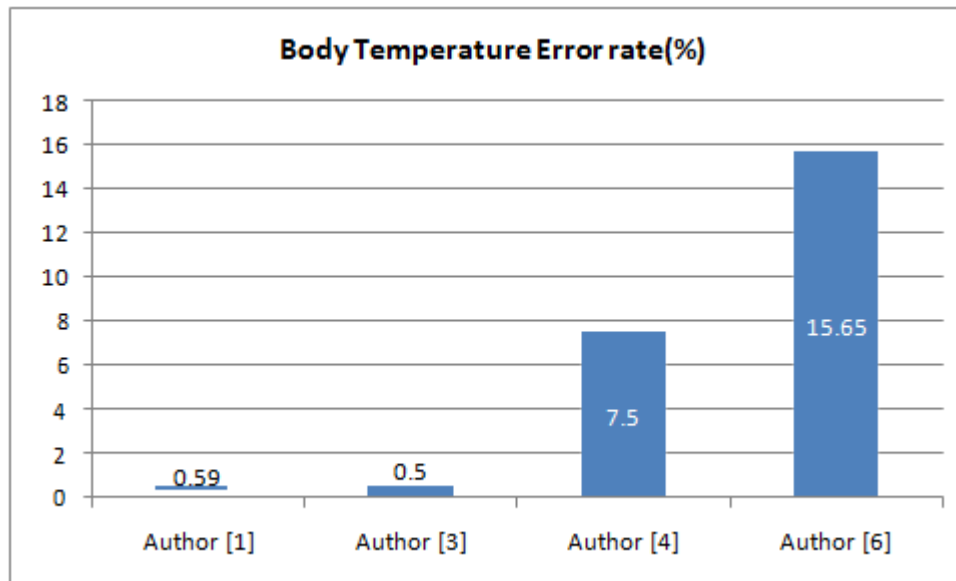
Table 3.2 Author [3] results

Serial No.	Body temperature value from Project Device (in °C)	Body temperature value from Digital Thermometer (in °C)	% of Error
1	33	35.88	8.02
2	33	35.82	7.87
3	30	32.21	6.86

Table 3.3 Author [4] results

Time (Hours)	Standard Temperature (°C)	Measured Temperature (°C)
7:00 AM	32	28
1:00 PM	34	28
7:00 PM	36	31.1
1:00 AM	37	30

Table 3.4 Author[6] results



**Figure 4.** Body temperature error rate comparison

## CONCLUSION

People can determine their health parameters using IoT-based devices, which could assist them, regulate their health over time. If the necessity arises, the sufferers may eventually seek medical help. Error rate of the IoT sensors very less so we can use it in our daily life. Cost of the IoT devices are less so it is cost efficient. Data generated through sensors are easy to transfer from IoT devices to cloud and access anywhere like web application and mobile application.

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**THE ABILITY OF ZOOM MEETING ON ALL STUDENTS TO IMPROVE MOOD AND REDUCE STRESS**

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**Mrs Annamma Santosh and Dr. Faiyyaz Shaikh****ABSTRACT**

*The Coronavirus pandemic has profoundly impacted all parts of life, including the unknown dialect educating settings. Colleges and schools deserted study halls and moved into online instruction settings. During prompt lockdowns which brought physical removing, terms like "on the web", "virtual", and "far off" schooling began to rule language educating and learning. Colleges and related foundations attempted to facilitate the prompt change from up close and personal schooling to online stages while understudies and educators started working from their homes. Instructive organizations enjoy taken benefit of different web-based simultaneous stages to find an elective way for eye to eye classes in the Coronavirus pandemic rapidly. One of those stages that have been widely utilized during these crisis conditions is Zoom which is a video conferencing and internet meeting administration for both individual and gathering classes. Inside this casing, this subjective unmistakable review plans to conceptualize the advantages of Zoom as a simultaneous device for online unknown dialect training at tertiary level during the Coronavirus pandemic. To arrive at the goal, first the connected writing on three explicit words "Zoom", "language training" and "Coronavirus" was concentrated by utilizing Google Researcher web search tool. Then, to restrict the examinations, the scientists zeroed in on the ones filed in the Trap of Science. Consequently, a sum of four hypothetical and observational investigations were gathered and inductively examined. This inductive examination uncovered five principal subjects; Zoom (1) exemplifies useful capabilities and instruments for instructive settings, (2) intercedes the progress from up close and personal training to online schooling, (3) makes a mentally agreeable environment for online instruction, (4) gives simultaneous connection, correspondence and participation, and (5) creates unknown dialect abilities. Furthermore, in light of these subjects and the applicable writing on the advantages of Zoom, the analysts revealed the relationship among these five topics to conceptualize the activities and cycles of shaping the positive commitments of Zoom on unknown dialect educating and getting the hang of during the Coronavirus pandemic. Watchwords: Zoom, Unknown dialect schooling, the Coronavirus pandemic, Online training*

*Keywords- Zoom Meeting, Stress, Mood.*

**INTRODUCTION**

The Covid illness 2019 or the popular shortening the Coronavirus pandemic has shaken our reality and changed our lives totally. The infection has been spreading universally starting from the primary affirmed case in China in December 2019. By seriously interfering with the typical working of the whole school system, this negative wave put instructive settings in question also by adjusting the modes and method for conveying and getting training. Along with the physical removing and prompt lockdowns, terms like 'on the web', 'virtual', and 'far off' training overwhelmed each school setting. Legislatures and organizations attempted to facilitate the change while understudies and educators worked from their homes. In this manner, because of Coronavirus pandemic, online schooling became one of the quickest developing sorts of training and "de rigeur method of guidance" (Reingold, 2021, p. 5). At the end of the day, online schooling has turned into the most broad type of training in the crisis conditions during the Coronavirus pandemic.

**RESEARCH METHODOLOGY:****RESEARCH APPROACH**

Quantitative Research Approach

**RESEARCH DESIGN:**

Pre experimental one group pre-test, post-test research design.

**POPULATION**

In this study population consist of School students of credence high school –Al Quoz Residing at Dubai

**SAMPLING TECHNIQUE:-**Non probability non convenient sampling technique.

**Percentage and Frequency**

They are most frequent way to represent statistics.



## • ANOVA

It is statistical method in which variation in set of observation is divided into components.

### SAMPLE SIZE:

It comprises of 500 students studying in School.

### INCLUSION CRITERIA FOR SAMPLING:

- (1) Students who are available at time of data collection.
- (2) Students who are willing to participate in study.
- (3) Students who are able to read, write and understand English language.

### EXCLUSION CRITERIA FOR SAMPLING:

- (1) Students who are suffering from any stress
- (2) Students who are not present at time of any of test may be pre or post test.

### WITHDRAWAL CRITERIA FOR SAMPLING:

- (1) Students who wants to withdraw from study.

### STATISTICAL TECHNIQUE

Required permission from authorities will be taken before study. Then samples will be selected as per inclusion criteria. analysis of data is based on objectives of study.

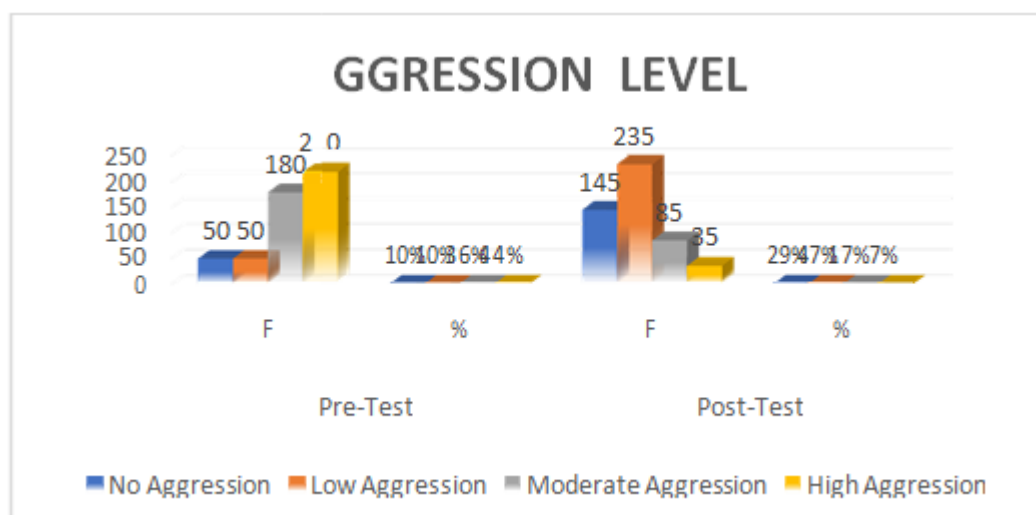
The data will be analyzed as following:

- 1] Demographic of subjects will be analyzed using frequency and percentage.
- 2] Pre-test and post-test knowledge scores will be analyzed using frequency and percentage, Mean and standard deviation.
- 3] Effectiveness of Zoom meeting on level of stress will be analyzed by using descriptive and inferential statistical methods. Paired 't' test by measuring significant difference between pre-test and post-test scores.
- 4] Using SPSS software version 23

## RESULT AND DISCUSSION

### Knowledge Scores of Pre-test and Post-test based on Level of Aggression to Zoom meetings

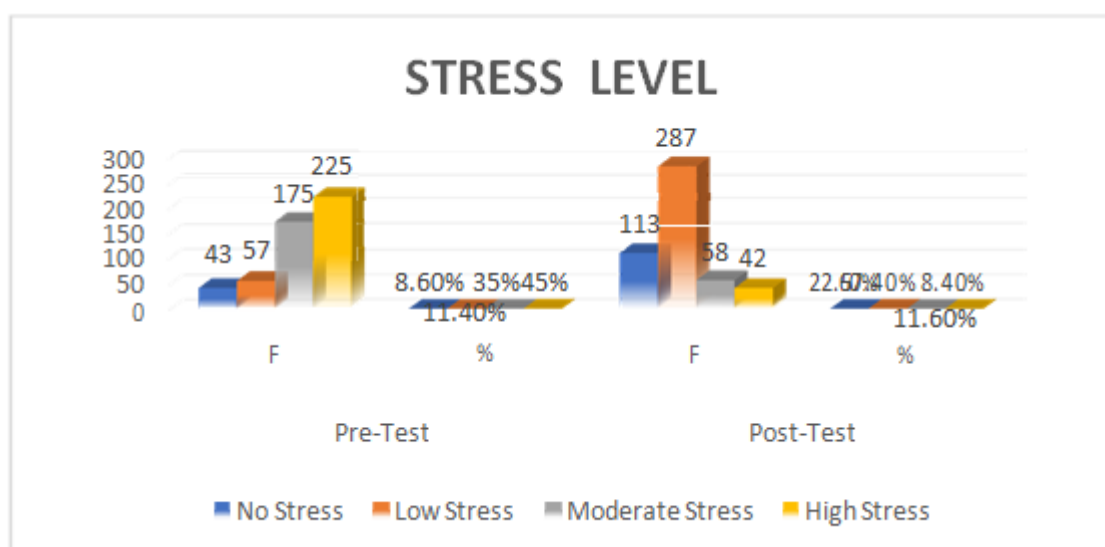
AGGRESSION LEVEL	Pre-Test		Post-Test	
	F	%	F	%
No Aggression	50	10%	145	29%
Low Aggression	50	10%	235	47%
Moderate Aggression	180	36%	85	17%
High Aggression	220	44%	35	07%
Total	500	%	500	%



**Tab.and graph** states about aggression level while Display Zoom meetings amongst students in which maximum observed in higher aggression I.e. 44% in pre test which decreased upto 07% in post test whereas no aggression observed in post test i.e. 29%.

**Knowledge Scores of Pre-test and Post-test based on Level of Stress and depression to Zoom meetings**

STRESS LEVEL	Pre-Test		Post-Test	
	F	%	F	%
No Stress	43	08.60%	113	22.60%
Low Stress	57	11.40%	287	57.40%
Moderate Stress	175	35%	58	11.6%
High Stress	225	45%	42	08.40%
Total	500	%	500	%



**Tab.and graph** states about stress level while Zoom meetings amongst students in which maximum observed in higher stress I.e. 45% in pre test which decreased upto 08.40% in post test whereas lower stress observed in post test i.e. 57.40% and no stress were observed as 22.60%.

**Comparison of Means Scores of Level of Stress between Pre-test and Post-test**

Group	Pre test	Post test
SD	8.229	11.768
t-value	1.176	
Df	28	
Sig (2 tailed)	0.251	

## CONCLUSION

In our reality where uncommon occasions have made web based learning mandatory as opposed to discretionary, the spread of examination results on the utilization of online apparatuses is vital for instructive settings. Inside this edge, the reason for this study was to research the advantages of Zoom related with online unknown dialect training during the Coronavirus pandemic. Through the examination of four Trap of Science ordered investigations which were chosen with the watchwords "Zoom", "language training" and "Coronavirus", this subjective enlightening review uncovered five topics. These subjects are: Zoom (1) exemplifies useful capabilities and instruments for instructive settings, (2) intervenes the change from f2f training to online schooling, (3) makes a mentally agreeable climate for online training, (4) gives coordinated connection, correspondence and collaboration, and (5) creates unknown dialect abilities. Furthermore, in view of these subjects and the pertinent writing on the advantages of Zoom, the analysts revealed the relationship among these five topics to conceptualize the activities and cycles of framing the positive commitments of Zoom on unknown dialect educating and getting the hang of during the Coronavirus pandemic. There have been extreme changes in instructive settings since Coronavirus, and adverse consequences of the pandemic, for example, "crown gloom, diminishing of scholarly norm, enlarging learning hole, and absence of interactive abilities" (Lee and Yin, 2021) are among numerous others that ought to be viewed as profoundly. As per the World Wellbeing Association

(2021), as of December 1, 2021, there are 261,435.768 affirmed cases and 5,207.634 affirmed passings. Under these conditions, it doesn't appear to be that it is feasible to escape from the impacts of the pandemic reality sooner rather than later. Hence, what instructors, establishments or policymakers ought to do is to do what is their best inside their own specific situations, to realize what the others have done during the pandemic, to record the moves made however much as could reasonably be expected, and to report the accepted procedures overall for the others' advantages. There is an extraordinary potential for functional utilization of Zoom in unknown dialect showing settings at tertiary level, so organizations and educators ought to invest some energy on working on understudies' abilities in involving Zoom in the most ideal way conceivable too. This study is remembered to reveal an unmistakable insight into the previously mentioned focuses by uncovering the subjects about valuable parts of Zoom to concerning parties in the field.

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**THE CHANGING DIMENSIONS OF GLOBAL BUSINESS AND ECONOMIC INTEGRATION  
AMONG NATIONS WITH ITS IMPACT ON LOGISTICS AND SUPPLY CHAIN MANAGEMENT: A  
CASE OF TRAFFIC JAM AT THE SEA**

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**Dhritiman Sarma<sup>1</sup> and Akansha Bhatia<sup>2</sup>**<sup>1</sup>Student, Class 12<sup>th</sup>, St Thomas' School Dwarka, New Delhi, India<sup>2</sup>Student, Class 12<sup>th</sup>, The Modern School, Faridabad, Haryana, India**ABSTRACT**

*The world economies have steadily moved towards globalization, which has brought about increasing interdependence among nations small and big. Due to this global network of nations dependent with one another in all aspects there is seen a unique supply chain process emerging that is so heavily dependent on one another that the slightest of disruption in one place creates a ripple effect leading to large scale disruption in many corners of the world. This case study is an effort to understand the intertwined economic relations among nations with the famous case of Traffic Jam in the Suez canal in 2021 that led to large scale global shortages.*

*Key Words: Globalization, Neo Globalization, Logistics and Supply Chain, Supply Chain Disruption.*

**INTRODUCTION**

The term Globalization was coined by Theodore Levitt a Professor at Harvard Business School. The global economies over so many years have shown increasing interdependence among one another. There is a steady increase in cross country integration in terms of trade. The basic features of globalization of economy consists of free trade, liberalization of Import and Export, Privatization, Increased collaboration among nations to name a few. The same when looked in present times shows that there is not only movement of tangible elements in the economy like the goods and assets there is also increased digital dependence and movement of knowledge. This new aspect of globalization heralded by knowledge economy is termed as Neo-globalization. When we look at Neo-globalization closer we find that the whole process of supply chain has gone through a Paradigm shift.

**Neo-Globalization of Logistics and Supply Chain**

The logistic function has had transition over the years, moving from one idea to another and reaching the globalized perspective today. The concept owes its origin largely during the World War II in the 1940s when serious efforts were made to study the best ways in handling the military logistics. It was around this time that subject of operations research began to be used to research the best practices of logistics handling. During this period the focus of logistics management was to handle the warehouse designing container size assessment along with container management, warehouse layout designing and route mapping. Logistics being a labour-intensive operation, the focus was at that time to identify the optimization levels for human activities as well. Towards the mid 1950 the "unit load" concept gained popularity with the liberal use of pallets and the premise for transportation management was laid. This also became the foundation of Global Logistics that came many years down the line.

Towards the 1960s the transportation system began shifting from rail to trucks bringing about a need for the assimilation of warehouse management, handling of materials and shipping of freight. Here the concept of physical distribution emerged. For the systematization and standardization the National Council of Physical Distribution Management was formed in 1963 with members from USA and Canada that later in 1985 went on to become Council of Logistics Management. This organized effort gave a new perspective to the subject with an outlook that went beyond the national boundaries. Till the 1960s the records of the logistic function were all maintained manually, gradually with the introduction of computers in the later part of 1960s logistic planning became much more easier. Computerization helped in innovative logistics planning, arriving at the optimal inventory limit and the determination of the fastest and cost effective truck route, all this at the click of the mouse.

There was further streamlining of the logistics function with the introduction of the personal computers in 1980s that led to increase in its scope and outlook. Till the 1990s logistic function grew gradually to encompass a global outlook as countries gradually started assimilating with one another economically. The introduction of Enterprise Resource Planning (ERP) systems and the internationalization of the manufacturing processes saw the Logistic function take a Global perspective. The emergence of manufacturing hub like China, design hub like Germany, outsourcing hub like India saw the need to have a robust logistic network that would help in the seamless flow of resources across the world. Thus, the concept that started as a part of physical distribution system today has grown to become the life blood of business.

The focus on globalization brought about the need for logistics management to deal with a complex set of cross-country networks. A trend has emerged to use the term supply chain management as one that deals with strategic issues and logistics as one that deals with tactical and operational issues. This increasing association of supply chain management with strategy is seen in the Council of Logistics Management's changing its name to the Council of Supply Chain Management Professionals in 2005. They went on to define that "Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements" while "Supply Chain Management is the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole."

Before looking at the scenario of logistics and supply chain management around the world let us understand its role and relevance in the Indian economy. Indian economy is making an all out effort to augment its pace and to be reckoned as one of the fastest growing economy in the world. The role of a strong logistics and supply chain management in building a strong economy cannot be underestimated.

The recent push to make India a manufacturing hub with Government promoted schemes like "Make in India" and "Start Up India" have also given the much-needed impetus to development in Logistics and Supply Chain eco-system.

The contribution of Marine Logistics in India's trade is perhaps the most significant, with 95% of the country's trade by volume being handled by ports. As per the Logistics Performance Index 2018 brought out by World Bank, India is ranked 44<sup>th</sup>. Recognising the importance of logistics in Indian economic growth, the Government has added the Logistic into the Harmonized master List of Infrastructure Sub-Sector. The uniqueness of Logistics in India lies in the fact that the sector is largely dominated by unorganized players, primitive material handling infrastructure along with structural challenges in movement of goods across various modes of transport. Also accepting the challenges faced by the sector Government of India has opened a new logistic division in Department of Commerce. The role of this division is to facilitate the overall development of the industry.

Let us now discuss about the status of Logistic industry in Germany, Sweden and Belgium that have occupied the first three ranks in the Logistics Performance Index 2018 given by the World Bank. Germany is regarded as a pioneer and a pathbreaker in the field of Logistics. Germany carries a market share of approximately 30% of the logistics industry of Europe and Logistics sector contributes to 7% of the German Gross Domestic Product. The development of logistic sector in Germany is largely attributed to its strong road rail and waterways along with its creativity and value-added processes. Setting up of freight villages called *Güterverkehrszentren* in German which act as cargo support centres with optimal access to long-haul networks and local delivery points, use of innovative technology speech-based picking (Pick by Voice) facilities in warehouses have catapulted German logistic to the zenith in the world of logistics.

Sweden is another country that has a strong logistic network. It is the largest logistic network in the Scandinavia region. The location of the country has made it a preferred choice of the companies for distribution and warehousing activities in Northern Europe. Major global brands such as Adidas, Black & Decker, Canon, Dell, Michelin, Nike, Puma, Baxter, Nestle, Varner Gruppen has established their centralized distribution centers in Sweden.

The third ranked nation in terms of Logistic prowess is Belgium. The total contribution of Logistic sector to the Belgian economy is 7.6% of GDP . 8% of the total employment is generated by this sector. Belgium is a leader in pharmaceutical and chemical logistics operations due to its state-of-the-art infrastructure and continuous strive to innovation. Belgium's airports are the preferred pharma transport gateway to Europe and the world, with state-of-the-art infrastructure for temperature-sensitive goods. The cluster of ports in Belgium and internationally renowned for their storage and handling of all types of chemical products as they apply the highest safety, security, health, environment and quality standards (SSHEQ).

### **Case of Traffic Jam at Suez Canal**

As a case of impact that globalized business has had on supply chain processes we find that supply chain disruptions also can have a huge repercussion on the world economies. A case in point is that of the Traffic Jam at the Suez Canal in 2021.

In 2021, the Suez canal got blocked for ship movement after a large cargo ship got stuck sideways across the canal. This led to a large scale traffic jam situation in the sea. The ship that blocked the canal was a Panama registered container ship on its way to the Rotterdam Port in Netherlands travelling from China. The ship got stuck sideways due to bad weather. The ship was 400m long built in the year 2018 weighing 59 m in width. The Suez canal jam lasted for 6 days and 7 hrs.

The Suez canal was inaugurated by Ismail Pasha, Khedive of Egypt and the Sudan, in the year 1869. As per official records the first ship to navigate the canal was Imperial yacht of French Empress Eugenie, the L'Aigle and it was followed by the British Ocean Liner Delta [3]. The Suez Canal is managed and operated by the Suez Canal Authority (SCA) established on July 26<sup>th</sup> July 1956 which is the public and an independent authority reporting to the Prime Minister of Egypt [2]. The Suez canal is a major revenue generator for Egypt and as per data from Suez Canal Authority 2022, the revenue earned from the Canal in 2021 is \$6.3 Billion, the highest in the waterways history. The waterways also registered the largest annual net tonnage of 1.27 billion tonnes in 2021. There was a 10% increase in the number of ships passing through the canal in 2021 as compared to 2020.

The 2021 blockade of the Canal was a massive loss to global trade as per the Lloyd list it was about 12% of global trade amounting to \$9 Billion Per day. Which is equal to \$400 million worth of trade per hour or \$6.7 million per minute. According to Suez Canal Authority Chairman Osama Rabie, the Canal's revenue alone was taking a hit of \$14 million to \$15 million per day. Meanwhile, German insurer Allianz had said in an analysis that the blockage could shun global trade growth by 0.2 to 0.4 per cent on an annual basis [1]. Not only this the 6 days of supply chain disruption has led to massive losses to producers, and retailers as well.

## **CONCLUSION**

The intertwining of global economies and businesses is a good and has been able to give the world the best of resources men money and materials at its disposal but such cases of small disruptions bring the world businesses to a stand still when experts suggest that it is important also to have an alternative blueprint ready for play in case of disruptive conditions.

## **REFERENCE**

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3. <https://www.history.com/>

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**EVALUATION OF RELIABILITY OF YEN ANGLE FOR ASSESSING ANTEROPOSTERIOR SKELETAL DISCREPENCIES IN COMPARISON WITH ANB ANGLE, BETA ANGLE AND WITTS ANALYSIS**

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**ABSTRACT**

**Introduction** The evaluation of sagittal jaw relationship between maxilla and mandible has been one of the major problem in the field of orthodontics, which is of prime importance in diagnosis and treatment planning. This is because of rotations of jaws during growth, vertical relationships between the jaws and reference planes, and a lack of validity of the various methods proposed for their evaluation

**Aim & objectives:** The purposes of this study is to measure YEN angle for skeletal discrepancies and comparing it with ANB angle beta angle and wits analysis, to assess the reliability of YEN angle.

**Material & method:** A sample size of 30 patients will be screened in the orthodontic department of Inderprastha dental college and hospital.

**Result:** The value for the YEN angle in the Class I skeletal pattern group was 117 to 123 degrees, whereas the values in the Class II is less than 117 degrees, and class III skeletal pattern groups were greater than 123, respectively. The one -way ANOVA testing showed that there was a statistically cant difference between the mean values of YEN angle significant of the three groups

**Conclusion:** A new angle, the YEN angle, was developed as a diagnostic tool to evaluate the AP jaw relationship more consistently

**INTRODUCTION**

Orthodontic diagnosis is an important criteria for the success of any orthodontic treatment, have adequate knowledge of the dentoalveolar compensations that with respect to the underlying skeletal relationship<sup>1</sup>. Malocclusions are classified broadly based on dental and skeletal discrepancies. Skeletal discrepancies are sub classified based on the plane, that is, sagittal, transverse, and vertical discrepancies<sup>2</sup>. In orthodontic diagnosis and treatment planning, great importance has been attached to evaluating the sagittal apical base relationship, and this relationship is generally determined by cephalometric analysis. Cephalometry marked a beginning of a new era in the orthodontic diagnosis and treatment planning. Many measurements were incorporated by various researchers to get an accurate method to assess skeletal base discrepancy<sup>3</sup>.

There are numerous angular and linear measurements to assess the sagittal discrepancy between maxilla and mandible, which is of prime importance. Both angular and linear measurements have been incorporated into various cephalometric analyses to help the clinician, to diagnose discrepancies and establish the most appropriate treatment plan<sup>4</sup>. A number of geometrical parameters, such as the ANB angle, WITS analysis, Beta angle and symphyseal height and depth<sup>5</sup> have been defined and used effectively for the evaluation of Antero-posterior discrepancies affecting the apical bases of the jaws.

The first step in evaluating sagittal jaw relationship was Downs' description of points A and B in 1948. A few years later, Riedel's measured the S-N-A and S-N-B angles, using nasion as a reference point and used their difference, i.e. angle A-N-B, as an expression of dental apical base relationship. Since then, the A-N-B angle has been widely adopted as a principal method for evaluating sagittal jaw relationship. But there are certain shortcomings with ANB angle which includes the change in ANB value with change in the spatial position of the nasion either in the vertical or antero-posterior direction or both or with the upward or downward rotation of the Sella Nasion line and the change in the angle SN to the occlusal plane<sup>6</sup>. Hence, ANB do not depict the true anteroposterior relation of the maxilla and mandible.

Wits appraisal is a linear AO-BO distance between points A and B projected perpendicularly on the functional occlusal plane<sup>7</sup>. But it influenced by the position of Functional occlusal plane which in turn is difficult to identify in mixed dentition, open bite cases, severe cant of occlusal plane, missing teeth.

Beta angle. It uses three skeletal landmarks – point A, point B, and the apparent axis of the condyle (C) as a reference point to measure an angle that indicates the severity and the type of skeletal dysplasia in sagittal

dimension<sup>8</sup>. Point A and B are sometimes difficult to locate as it change their site substantially due to growth. In some situations, the condyle is not clearly visible either thus difficulty in locating center of condyle.

Though commonly used for diagnosis of skeletal relationships and assess the change s of treatment modalities like functional appliances<sup>9,10</sup>. ANB, WIT's appraisal and Beta angle do not provide a reliable estimation of the Antero-posterior relationship of the Jaw<sup>11</sup>, due to the above mentioned shortcomings. Also, Symphyseal height and depth is more reliable indicator for growth direction of the mandible rather than the anteroposterior relation of the jaws.<sup>5</sup>

Yen angle was reported by Neela et al in 2009<sup>12</sup>, It uses the following three reference points: S, midpoint of the sella turcica; M, mid- point of the premaxilla; and G, center of the largest circle that is tangent to the internal inferior, anterior, and posterior surfaces of the mandibular symphysis When S, M, and G are connected, they form the YEN angle, which is measured at M.

As YEN angle does not depend on any unstable landmarks or dental occlusion and would be especially valuable to assess true sagittal changes because of growth and orthodontic treatment<sup>3</sup>. So the purpose of this study is to compare the various angles ANB angle, Comparison of different angular measurements to assess sagittal Jaw discrepancy in Wits appraisal, and YEN angle used to measure antero-posterior discrepancy and to find out which is the most reliable amongst them.

### AIMS OF THE STUDY

The objective of the study is to measure, assess the reliability of a new cephalometric measurement Yen angle to evaluate the sagittal skeletal discrepancies and in relation with with ANB angle, Beta angle and Wits analysis

### Null hypothesis

There is no difference in cephalometric measurement in class I, II, III skeletal pattern

### MATERIALS AND METHODS

The study with a sample size of 30 individuals comes to the Department of Orthodontics and Dentofacial Orthopedics, Inderprastha Dental College and Hospital will be considered for the study.

The following inclusions as well as exclusion criteria were established for this study:

#### Inclusion Criteria-

- Completion of growth.
- All permanent teeth erupted including second molars.

#### Exclusion Criteria-

- Supernumerary or congenitally missing teeth (excluding third molar).
- Ectopic teeth or anomalies in tooth shape.
- Syndrome or craniofacial anomaly.
- History of orthodontic treatment.

Clinical examination was done, to select the patient to obtain pretreatment lateral cephalogram. After patient selection, the patient was informed about the study. If he/she agreed with the protocol, the consent form was signed by the patient.

### MATERIALS REQUIRED

1. Lateral Cephalograms (Fig.1)
2. 0.003" Lead acetate tracing paper (Fig.2)



Figure: 1

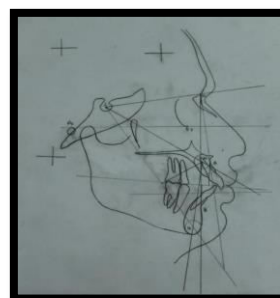


Figure: 2



3. Tracing table (Fig.3)
4. 0.5mm HB lead pencil
5. Geometry box (scale, protractor, rounder, set square) (Fig.4)
6. Scotch tapes
7. Eraser



**Figure: 3**



**Figure: 4**

### METHODOLOGY

Standardized pretreatment lateral cephalograms of 30 subjects (10 each of class I,II,III) coming to Department of Orthodontics and Dentofacial Orthopedics, Inderprastha Dental College and Hospital, Ghaziabad were obtained using machine, Kodak 8000C (Digital panoramic and cephalometric system) and an exposure time of 13 second, at 71 kV (p) and 10 mA., with the patient in the natural head position. . Source-to-film distance was 1.5 m, with Frankfort horizontal plane parallel to the floor and midsagittal plane perpendicular to floor .The distance from the focal point to the metallic ear rods was standardized at 152 cm and the distance from the metallic ear rods to the film was fixed at 16 cm, which will yield a magnification factor of 8.91%.

All the cephalograms were traced on to a 0.003 inch acetate paper using a 0.5 mm lead pencil under same illumination. All the tracings were performed by the principal investigator.

### The Following Landmarks Were Identified and Traced:

<b>Point A</b>	The deepest midline point on the premaxillae between the ANS and prosthion.
<b>Point B</b>	The most posterior point in the concavity between infradentale and pogonion.
<b>Point N</b>	Nasion, the most anterior point of the frontonasal suture in the midsagittal plane
<b>Point S</b>	Midpoint of sella (the centre of sella turcica)
<b>Point C</b>	The center of the condyle, found by tracing the head of the condyle and approximating its center
<b>Point M</b>	Midpoint of the premaxilla
<b>Point G</b>	Center of the largest circle, i.e., at a tangent to the internal inferior, anterior, and posterior surfaces of the mandibular symphysis

### Lines and planes used in the analysis:

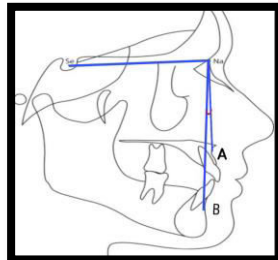
<b>N- A Line</b>	Line connecting N and A points
<b>N- B Line</b>	Line connecting N and B points
<b>S-M Line</b>	Line connecting Sand M points
<b>M-G Line</b>	Line connecting M and G points
<b>C-B Line</b>	Line connecting the center of the condyle,C with B points .
<b>A-B Line</b>	Line connecting Aand B points

### The Three parameters were measured as follows:

#### 1. ANB angle (Fig. 5):

- To construct ANB angle, points A, B, and N (Nasion) were located.

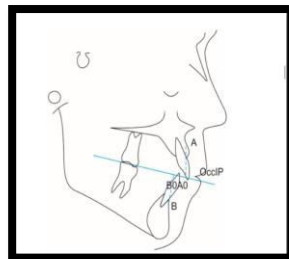
- Two lines, N–A and N–B, were drawn.
- ANB angle is between the N–A line and the N–B line at point N.
- Normal range of ANB angle is  $0^{\circ}$  to  $4^{\circ}$ .
- $\text{ANB} > 4^{\circ}$  is considered class II
- $\text{ANB} < 1^{\circ}$  is skeletal class III relation.



**Figure: 5**

## 2. Wits appraisal (Fig. 6):

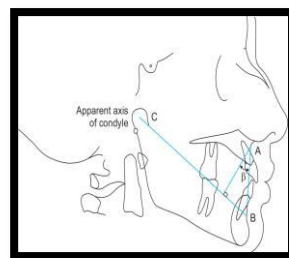
- AO–BO distance or Wits assessment is a linear distance between points A and B projected perpendicularly on the functional occlusal plane.
- In females, the normal value is 0 mm and in males it is  $-1$  mm.
- In skeletal class II, point BO was positioned well behind point AO (positive reading).
- In class III, point BO is ahead of point AO (negative reading).



**Figure: 6.**

## Beta angle (Fig. 7):

- To construct Beta angle, points A, B, and C (the apparent axis of condyle) were identified.
- Three lines C–B, A–B, and a line from point A perpendicular to C–B line were drawn.
- Beta angle is the angle between the perpendicular line and the A–B line.
- Beta angle between  $27^{\circ}$  and  $35^{\circ}$  can be considered as class I skeletal pattern.
- Angle  $< 27^{\circ}$  indicates class II
- Angle  $> 35^{\circ}$  indicates a class III skeletal pattern.



**Figure: 7**

After measuring all the Parameters, On the basis of ANB angle, Beta angle, Wits appraisal selected patients were divided into below mentioned groups. To be included in the skeletal Class I group, a patient had to have a minimum Two of the three parameters (ANB, Wits appraisal, and Beta angle), indicating a Class I relationship.

### Group I included subjects with:

• ANB -2 to 4 degrees
• Wits coincidence of AO and BO in females
• BO 1 mm ahead of AO in males
• Beta angle -27 to 35 degrees.

### Group II included subjects with:

• ANB angle more than 4
• Wits appraisal with AO ahead of BO in females
• AO coinciding with or ahead of BO in males
• Beta angle less than 27 degrees.

### Group III included subjects with:

• ANB angle $<2^{\circ}$
• Wits appraisal with BO ahead of AO in females
• BO ahead of AO by more than 1 mm in males
• Beta angle greater than 35 degrees.

The same lateral cephalogram will be further traced and measured the Yen angle.

### Yen Angle (Fig. 8):

- To construct Yen angle, points S, M, and G were located. G and M points were originally introduced by Nanda and Merrill It uses the following three reference points: S, midpoint of the sella turcica; M, mid- point of the premaxilla; and G, center of the largest circle that is tangent to the internal inferior, anterior, and posterior surfaces of the mandibular symphysis.
- Two lines, S-M and M-G, were drawn. The Yen angle is measured between lines S-M and M-G at point M.
- Yen angle between  $117^{\circ}$  to  $123^{\circ}$  is considered as skeletal class I.
- Yen angle  $<117^{\circ}$  is considered as class II.
- Yen angle  $>123^{\circ}$  is considered as skeletal class III.

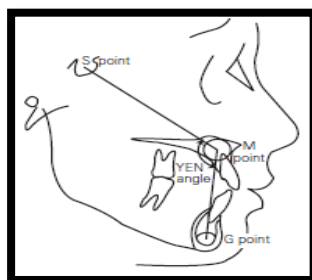


Figure: 8

After collection of data, Mean values of angles were calculated, in the three different skeletal Angle and to assess the reliability of Yen angle in correlation with ANB angle, Beta angle, and Wits appraisal.

### STATISTICAL ANALYSIS

Microsoft Excel was used to compile the data. Means and standard deviations of the angles were calculated. Statistical Package for the Social Sciences software (SPSS) was used for statistical analysis. Pearson's correlation coefficient, sensitivity, specificity, and accuracy were calculated.

Mean (SD) values of the ANB, Wits appraisal, and Beta angle in the skeletal Class I, II, and III.

	N	CLASS I		CLASS II		CLASS III	
		Mean	Std.dev	Mean	Std.dev	Mean	Std.dev
ANB	10	2.4	0.5	5.5	0.7	0.48	0.25
WITS APPRAISAL	10	1.0	0.4	2.9	0.5	5.8	0.9
BETA ANGLE	10	29	3.2	23	2.1	39	2.4

Table No.1

The one -way analysis of variance (ANOVA) was used to determine whether there was a statistically significant difference between the mean values YEN angle of significance in the three groups. A P value  $\leq 0.05$  was considered to be significant. Mean and Standard deviation values of the YEN angle in the skeletal Class I, II, and III groups according to the classification based on the ANB, Wits appraisal, and Beta angle.

	N	CLASS I		CLASS II		CLASS III	
		Mean	Std.dev	Mean	Std.dev	Mean	Std.dev
<b>YEN ANGLE</b>	10	117	8.0	121	7.7	127	7.8

Table No.2

Correlation matrix for ANB angle, Beta angle, Wits appraisal, Yen angle. P value  $\leq .05$  was considered to be statistically significant.

#### PEARSON CORRELATION(r)

Variable	Class	Pearson Correlation	ANB	WITS APPRAISAL	BETA Angle
<b>Yen Angle</b>	Class 1	r-value	-.628	0.656	0.179
		p-value	0.052	0.039	0.622
	Class 2	r-value	-.643	0.268	-.644
		p-value	0.045	0.454	0.044
	Class 3	r-value	-.741	-.363	-.532
		p-value	0.014	0.303	0.113

Table No.3

## RESULTS

Table 1 & 2 shows the descriptive statistics of Class I, Class II, and Class III for the sample of 10 subjects for each group.

Table 3 shows the Pearson's correlation coefficient (r) among all the four sagittal jaw markers: ANB angle, Beta angle, Wits appraisal, Yen angle in the overall sample. The r value of Yen angle shows higher value of correlation with ANB, AO-BO and Beta angle.

Thus, looking at the highest correlation of Yen angle, with Classification based on ANB, AO-BO, and Beta angle in the overall sample.

## DISCUSSION

Evaluation of sagittal jaw discrepancy is an indispensable step in every orthodontic diagnosis. An accurate anteroposterior evaluation of maxillomandibular relationships plays a critical role in orthodontic diagnosis and treatment planning.

Many angular and linear measurements have been devised till date, which uses different reference points and planes for measurement. Different analyses may, at times give different values for the same jaw relationship due to change in the reference planes. ANB angle, Wits appraisal, and Beta angle are the commonly used sagittal jaw indicators in regular orthodontic diagnosis.

In this study, an attempt was made to check the reliability and accuracy of Yen angle with the routinely used measures, so as to assess their clinical use and predictability as sagittal jaw indicators.

As the angular measurements are influenced by changes in facial height, inclination of the jaws, and jaw prognathism whereas linear variables can be influenced by the inclination of the reference line. The advantage of Yen angle is that it eliminates the difficulty in locating points A and B, or the functional occlusal plane used in Wits and condyle axis in beta analysis. As it is not influenced by growth changes, and it can be used in mixed dentition also.

From this present study, Table 1 show Mean and Standard deviation of class I, class II, class III for the sample of 10 subjects for each group based on ANB, WITS APPRAISAL, BETA ANGLE.

In Table 2, shows the mean value of Yen angle recorded in the present study for skeletal Class I ( $117 \pm 8$ ), Class II ( $121 \pm 7.7$ ), and Class III ( $127 \pm 7.8$ ).

Table 3, shows the correlation among all the four parameters, wherein it can be seen that they all show a significant correlation ( $< 0.05$ ) with each other, suggesting that all the four parameters can be successfully used in assessing the sagittal jaw discrepancy. This finding correlates with that of Mittal et al<sup>11</sup>, Doshi et al<sup>12</sup>, Trivedi et al<sup>13</sup>, and Alam et al<sup>14</sup>.

Yen angle shows highest correlation with ANB angle ( $r=-.741, p=0.014$ ) and wits appraisal ( $r=0.656, p=0.039$ ), least with Beta angle ( $r=-.644, p=0.044$ ).

The one-way ANOVA testing showed that there was a statistically no difference between the mean values of YEN angle significant of the three groups.

In routine cephalometric analysis, ANB angle was the first choice for assessment of sagittal jaw discrepancy and is almost always calculated. Though ANB angle is the clinician's first choice in assessing, but it would be unjustified if the limitations of ANB are overlooked. The vertical height of the face, the anteroposterior position of nasion, and rotation of jaws either due to growth or treatment has a direct effect on the values of ANB.

In this study, the assessment of Yen angle in this study showed a strong correlation with ANB angle. Thus, in this study, overall Yen angle shows better performance.

Thus, it can be stated overall that as all the four sagittal indicators show a significant correlation with each other despite using different reference planes and methods of assessment, it would be justified to use more than one parameter for deciding sagittal dysplasia of any orthodontic case. Further, Yen angle can be used as sagittal jaw indicators in addition to the established measures, especially when alveolar remodeling during extensive anterior tooth movement is expected, as landmarks used in these angles are not influenced by changes.

## CONCLUSION

In our study it was found out that, Yen angle performed well than the entire three parameters i.e. ANB angle, Beta angle, Wits appraisal, so it can be asserted that Yen angle is highly reliable for assessment of sagittal jaw discrepancies in addition to the established angles. Previously established measurements for assessing the sagittal jaw relationship can often be misleading. Yen angle were most significant for differentiating Class I, class II, class III groups.

Subjects with a YEN angle 117-123 degrees have a Class I skeletal pattern; a YEN angle less than 117 degrees indicates a Class II skeletal pattern and a YEN angle greater than 123 degrees indicates a Class III skeletal pattern.

## LIST OF TABLES

<b>TABLE 1</b>	Data subjected to ANOVA
<b>TABLE 2</b>	Mean value of YEN angle
<b>TABLE 3</b>	Pearson's co-relation

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**IMPACT OF SOCIO-ECONOMIC STATUS ON MULTIPLE INTELLIGENCE OF SECONDARY SCHOOL STUDENTS IN DIFFERENT BOARDS OF EDUCATION IN MUMBAI**

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**Mrs. Arya Ajit Tawde<sup>1</sup> and Prof. Judy Grace Andrews<sup>2</sup>**<sup>1</sup>Research Scholar, Gandhi Shikshan Bhavan's Smt. Surajba College of Education, University of Mumbai, Mumbai, Maharashtra<sup>2</sup>Research Guide, Principal, Royal College of Education, Mira Road, Thane, Maharashtra**ABSTRACT**

*Intelligence is the intellectual potential a person possesses from his birth. It can be measured and is an ability that is difficult to change. This Intelligence can be affected due to external socioeconomic factors like income, working status and qualification of the parents, number of siblings, and nature of the family and its composition. The paper aims to identify the impact of Socioeconomic status on Multiple Intelligence of Secondary School students on different boards of Education in Mumbai. The study's data is based on primary data; hence a descriptive-analytical study was done on 150 students in grades 9th and 10th through random sampling. Socioeconomic status scale constructed and standardized. Statistical tools such as Arithmetic mean and standard deviation are used for data analysis. For the Study of objectives and hypothesis testing, inferential data ANOVA, F-test, and correlation tests are applied. For the analysis of data, SPSS software is used.*

*Keywords: Socioeconomic factors, multiple Intelligence, education,*

**INTRODUCTION**

Intelligence is essential to students' academic and life performance in today's education. Intelligence is the individual's aggregate or global capacity to behave purposefully, think logically, and deal effectively with the environment. Every child possesses a unique level of Intelligence. Intelligence is the ability to learn quickly and accurately, solve issues logically and react to societal changes.

The concept of multiple Intelligence comprises different capabilities present in varied areas. An individual possesses these varied capabilities from birth, and he excels in them as he grows and utilizes them in his daily life. In contrast, one or more Intelligence can be more predominant (Akpınar, 2012). The theory of multiple Intelligence that Gardner put forward claims that autonomous powers and capabilities shape every individual's level of Intelligence and that every child has Intelligence in either single or additional areas. Further, Gardner affirms that Multiple Intelligence is a visible indicator of success in multiple areas such as music, sport, painting, self-awareness, and assessment.

*An Individual's socioeconomic status* is the demography, as well as his or her position compared with other people living in the same area. External environmental factors such as parental income, employment status, educational qualifications, number of siblings, the type of family they live in, and demographic characteristics such as age and gender all impact a student's Intelligence.

The family background of students has a significant impact on their lives both inside and outside of the classroom. Factors such as socioeconomic position, whether the family is run by one or two parents, divorce parent, material possessions, the number of family members, and the individuals who live nearby all contribute to the family backdrop. Children's essential socialization and career choices are influenced by their parental environment.

**LITERATURE REVIEW**

**1. Sahidul Alam & Dr. Md Rofikul Islam (2020)**, Academic performance or achievement of the students is found to be correlated with their study habits and socioeconomic status; hence it is very much essential for educational institutions such as schools to play an important role in encouraging and promoting good study habits and affirmative learning attitudes among students. As we all know, study habits are learnable and teachable. Hence, institutions should take innovative measures to improve the study habits of students. Besides study habits, socioeconomic status was a good predictor of academic achievement. Modern-day, educating a child is a good function for school with lots of expenditure. So, it is the responsibility of the planners, administrators, and govt. Authorities to make provisions, policies, and programs for the betterment of the downtrodden and socio-economically weaker sections, which could make them able to send their child to a good school.



1. **Leonard T Das, Kumar Das (2019)**, Digitization is a logical sequel to globalization. India's digital economy is an expected path or journey toward development without waiting for costly and time-consuming industrial infrastructure investments to bear fruit. However, it has many cons and perils. For the upward growth of the economy, it is crucial for the government, business fraternity, and the people to realize the significance of digitization. Given the vast divide between rural and urban India and the digital haves and have-nots, it is over ambitious to expect digitization as the key to maintaining India's global competitiveness. Pessimism is terrible, but over-optimism is worst. Better access and affordability of digitization services are required to improve human capital as a component of social capital. It is a big challenge for policymakers to design sectoral digitization plans, build capabilities and enablers, and monitor the ecosystem. The real challenge of policymakers is to get better at doing rather than talking.
1. **Dr. Twinkle Manhas (2019)**, education is a fundamental pillar in the growth and development of any country. Multiple Intelligence theory provides a guide for teachers and trainers to assess and develop more and more abilities in students by exploring alternative teaching and assessment strategies. This detailed review suggests that very few studies are related to Multiple Intelligences in the Indian context. Also, it is a well-known fact that in India, people have many differences in socioeconomic status. Various socioeconomic variables like the educational level of each parent, working status of parents, income and occupation status, and no. of siblings may affect the level of multiple intelligences. A negligible number of studies from the past have determined the relationship between multiple Intelligence and socioeconomic variables in India and abroad.
2. **Nourish Chandra Mondal (2018)**, The result of this examination work has prompted the accompanying end from the investigation of the outcome; it shows that there are areas of strength between the family financial foundation and scholarly accomplishment of senior optional school understudies of the area under review. Nonetheless, despite areas of strength between family financial and schooling accomplishment, some of the time, there is a unique situation whereby those kids with unfortunate family foundations are preferred scholastically over those from excellent family foundations.
1. **Shaikh, N.1, Khan, Shah Mohd., Wakpainjan, P. (2016)**, Subsequently, it was reasoned that there was a vast contrast in the mean scores in VII and IX grade young men on various insights. The mean scores of grades IX were as high as Grade X young men and massive at 0.01 level. The Effect size for the thing that matters was changing between .04 to .12, which is negligible and makes sense of around 1% of the absolute difference. The speculations were dismissed for every one of the kinds of insights regarding grades. The correlation among the components of Multiple Intelligences concerning Grades of the sample shows that the Inter-relationships among all elements of Multiple Intelligences for the two grades are positive and profoundly huge. While contrasting the greatness of coefficients between grades showed that all coefficients for X Grade understudies are somewhat higher than IX Grade. The speculations were dismissed for every one of the sorts of insights regarding grades. Profile examination demonstrates the degrees of insights among IX and X grade young ladies and young men. X grade young men are viewed as high on various insights, followed by IX grade young men. X grade young ladies, and IX grade young ladies individually. The speculation was somewhat dismissed for every one of the sorts of insights regarding grades.

## RESEARCH METHODOLOGY

For the research on "Impact of Socioeconomic score on Multiple Intelligence of Secondary School students," the primary data is collected through a random sampling technique. A total of 150 student Responses are collected through a structured questionnaire with closed-ended questions regarding the demographics of the students and questions related to the research study. Further data analysis and hypothesis testing are done using SPSS 23 software. Statistical tools such as Percentages, averages, Correlations, ANOVA, and F tests are used for the hypothesis testing. The reliability of the data is verified using the Cronbach alpha test.

## OBJECTIVES OF STUDY

1. To study the impact of socioeconomic status on multiple Intelligence of secondary school students.
2. To Study multiple Intelligence according to the gender of students and economic condition of the family.

## The hypothesis of the Study

**Null Hypothesis H01:** There's no significant relationship between socioeconomic and Multiple Intelligence scores of Secondary school students.

**Null Hypothesis H02:** There's No significant difference in the Multiple intelligence score of students across their Grade.



**Null Hypothesis H03:** There's No significant difference in the Multiple intelligence score of students across their gender.

**Null Hypothesis H04:** There's No significant difference in the Multiple intelligence score of students across their annual family income.

### RESEARCH REPORT- Multiple Intelligence score

Information related to the Study of "Impact of Socioeconomic score on Multiple Intelligence of Secondary School students" is collected through a detailed structured Questionnaire. A total of 150 student respondents participated in this study.

Data related to Demographics is rated, classified, and presented in the following table:

Demographics is rated, classified and presented in the following table:

Demographics		Frequency	Percentage
Gender	Male	70	46.7
	Female	80	53.3
	9 <sup>th</sup>	44	29.03
	10 <sup>th</sup>	106	70.7
Annual Family Income	Below Rs 250000	79	52.7
	Rs 250001 to Rs 500000	20	13.3
	Rs 5000001 to Rs 750000	5	3.3
	Rs 750001 to Rs 1000000	4	2.7
	Rs 1000001 to Rs 1200000	11	7.3
	Rs 1200001 to Rs 1500000	10	6.7
	Above Rs 1500000	21	14.0
Socio-economic level	Low	30	20.0
	Moderate	91	60.7
	High	29	19.3

The above table indicates that out of 150 student respondents, 70 student respondents are male, and 80 are female student respondents. 54 student respondents are from grade 9th, and 106 are from grade 10th. Further, 79 student respondents have an annual family income below Rs 250000, and 20 student respondents have an annual family income between Rs 250001 and Rs 500000. There are 5 students' respondents are having an annual family income between Rs 5000001 to Rs 750000, and 4 students respondents have an annual family income between Rs 750001 to Rs 1000000. 11 students respondents have an annual family income between Rs 1000001 to Rs 1200000, 10 students respondents have annual family income between Rs 1200001 to Rs 1500000, and 21 students respondents have annual family income above Rs 1500000. Moreover, 30 respondents are from Socioeconomic low levels, 91 are from moderate levels, and 29 are from high levels.

### Socioeconomic Score

The Socioeconomic Score includes the demographics such as parents' education, Annual family income, Type of housing they reside in, and facilities the students get are used. Responses for these demographics are rated appropriately.

Using the above ratings and appropriate formulae, the mean score for the Socioeconomic score of respondents is calculated for each respondent and also for all 150 respondents collectively. Descriptive Statistics for the same are as follows:

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Socio economic status score	150	19.23	88.46	50.5385	14.91294
Valid N (listwise)	150				

The table above reflects that the mean score for the Socioeconomic score is 50.53 percent, with a standard deviation of 14.91. It indicates moderate variation in the responses.

### MULTIPLE INTELLIGENCE

Multiple Intelligence consists of 9 different parameters. These parameters are 1) Naturalist Intelligence, 2) Musical Intelligence, 3) Logical-Mathematical Intelligence, 4) existential Intelligence, 5) Interpersonal

Intelligence, 6) Bodily Kinaesthetic Intelligence, 7) Linguistic Intelligence, 8) Intrapersonal Intelligence, and 9) Spatial Intelligence. Information is collected by asking relevant questions for each of the nine parameters. These responses to questions related to each parameter are considered collectively for the Multiple Intelligence score.

Using the ratings for the questions related to Multiple Intelligence and appropriate formulae, the mean score for the Multiple Intelligence score of respondents is calculated collectively for each respondent and all 150 respondents. Descriptive Statistics for the same are as follows:

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Multiple Intelligence score	150	21.28	95.00	64.6784	11.29592

Above table indicates that the mean score for Multiple Intelligence score is 64.67 per cent with standard deviation of 11.29. It indicates moderate variation in the responses.

### CRONBACH'S ALPHA TEST:

**Test of reliability of scale:** This test is used for validation of Likert scale used in the questionnaire.

To validate the scale in this study Cronbach Alpha test is applied. Test is applied for all 150 respondents. The following table represents the results of the test:

Variable Name	No. of subgroups	Cronbach Alpha	Result
Multiple Intelligence score	81	0.762	Scale is reliable and accepted

The above results indicate that the Cronbach Alpha values for the variable are more than the required value of 0.700. Hence the test is accepted. The conclusion is **scale is reliable and accepted**.

### HYPOTHESIS TESTING

**Null Hypothesis  $H_{01}$ :** There is no significant relationship between Socio-economic score and Multiple Intelligence score of the Secondary school children.

**Alternate Hypothesis  $H_{11}$ :** There is a significant relationship between Socio-economic score and Multiple Intelligence score of the Secondary school children.

To test the above Null hypothesis Pearson Correlation is applied and tested for its significance. The results are shown in the below table:

Correlations			
		Socio economic status score	Multiple Intelligence score
Socio economic status score	Pearson Correlation	1	.251**
	Sig. (2-tailed)		.002
	N	150	150
Multiple Intelligence score	Pearson Correlation	.251**	1
	Sig. (2-tailed)	.002	
	N	150	150
**. Correlation is significant at the 0.01 level (2-tailed).			

**Interpretation:** The above table shows that the calculated Pearson correlation coefficient between Multiple Intelligence score and the Socio-economic status of students is 0.251. The calculated p-value is 0.002. This is less than 0.05. Therefore, the test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

**Conclusion:** There is a significant relationship between Socio-economic score and Multiple Intelligence score of the Secondary school children.

**Finding** is that there is a Positive relationship between Multiple Intelligence score and the Socio-economic score of students. Moreover, the p-value suggests that as the Socio-economic score increases, there is a significant and definite increase in their Multiple Intelligence score.

**Null Hypothesis  $H_{02}$ :** There is no significant difference in the Multiple intelligence score of students across their Grade.

**Alternate Hypothesis  $H_{12}$ :** There is a significant difference in the Multiple intelligence score of students across their Grade.

To test the above Null Hypothesis ANOVA is obtained and F-test is applied. Results are shown in the table below:

ANOVA					
Multiple Intelligence score					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1342.591	2	671.295	5.585	.005
Within Groups	17669.499	147	120.201		
<b>Total</b>	<b>19012.089</b>	<b>149</b>			

**Interpretation:** The above results indicate that calculated p-value is 0.005. It is less than 0.05. Therefore F-test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

**Conclusion:** There is a significant difference in the Multiple intelligence score of students across their Grade.

**Finding** is that the mean score of Multiple intelligence score of students is significantly different across their Grade. It is higher for the students of grade 10 as compared to other students. This can be observed in the following table:

Report			
Multiple Intelligence score			
Grade	Mean	N	Std. Deviation
Grade 8	52.5600	2	22.74055
Grade 9	60.6210	42	9.89950
Grade 10	66.5147	106	11.18433
<b>Total</b>	<b>64.6784</b>	<b>150</b>	<b>11.29592</b>

The above table indicates that the Multiple Intelligence score of the students is highest at 66.51 percent for the grade 10 students, while it is lowest at 52.56 percent for the grade 8 students.

**Null Hypothesis  $H_{03}$ :** There is no significant difference in the Multiple intelligence score of students across their gender.

**Alternate Hypothesis  $H_{13}$ :** There is a significant difference in the Multiple intelligence score of students across their gender.

To test the above Null Hypothesis ANOVA is obtained and F-test is applied. Results are shown in the table below:

ANOVA					
Multiple Intelligence score					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	267.418	1	267.418	2.111	.148
Within Groups	18744.671	148	126.653		
<b>Total</b>	<b>19012.089</b>	<b>149</b>			

**Interpretation:** The above results indicate that the calculated p-value is 0.148. It is more than 0.05. Therefore F-test is accepted. Hence Null hypothesis is accepted and the Alternate hypothesis is rejected.

**Conclusion:** There is no significant difference in the Multiple intelligence score of students across their gender.

**The finding** is that the difference in the mean score of Multiple intelligence scores of students is highly insignificant across their gender. It is similar for both male and female students. This can be observed in the following table:

Report			
Multiple Intelligence score			
Gender	Mean	N	Std. Deviation
Male	63.2510	70	12.19000
Female	65.9274	80	10.36763
<b>Total</b>	<b>64.6784</b>	<b>150</b>	<b>11.29592</b>

The above table indicates that the Multiple Intelligence score of the students is highest at 65.92 percent for the Female students, while it is lowest at 63.25 percent for male students.

**Null Hypothesis  $H_{04}$ :** There is no significant difference in the Multiple intelligence score of students across their annual family income.

**Alternate Hypothesis  $H_{14}$ :** There is a significant difference in the Multiple intelligence score of students across their annual family income.

To test the above Null Hypothesis ANOVA is obtained and F-test is applied. Results are shown in the table below:

ANOVA					
Multiple Intelligence score					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1622.757	6	270.460	2.224	.044
Within Groups	17389.332	143	121.604		
<b>Total</b>	<b>19012.089</b>	<b>149</b>			

**Interpretation:** The above results indicate that the calculated p-value is 0.044. It is less than 0.05. Therefore F-test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

**Conclusion:** There is a significant difference in the Multiple intelligence score of students across their annual family income.

**The finding** is that the mean score of Multiple intelligence score of students is significantly different across their annual family income. It is lower for students with lower annual family incomes. This can be observed in the following table:

Report			
Multiple Intelligence score			
Annual family income	Mean	N	Std. Deviation
Rs 2, 50,000 and below	62.2808	79	11.90997
Rs 2,50,001 - Rs 5,00,000	63.8475	20	6.85775
Rs 5,00,001 - Rs 7,50,000	67.4480	5	4.95585
Rs 7,50,001 - Rs 10,00,000	62.7625	4	9.64853
Rs 10,00,001 - Rs 12,50,000	69.0945	11	8.97715
Rs 12,50,000 - Rs 15,00,000	66.3800	10	16.10668
Above Rs 15,00,000	71.0714	21	9.78121
<b>Total</b>	<b>64.6784</b>	<b>150</b>	<b>11.29592</b>

The above table indicates that the Multiple Intelligence score of the students is highest at 71.07 percent for the students whose annual family income is above Rs 1500000, while it is lowest at 62.28 percent for the students whose monthly family income is Rs 2, 50,000 and below.

## FINDINGS AND CONCLUSION

There is a strong positive relationship between the Socioeconomic score and the Multiple Intelligence score of the Secondary students. In other words, if the socioeconomic condition is better then multiple intelligence is also better. There are many direct and indirect effects of socio-economic status. Students learn many things by observation. The Multiple Intelligence score of the secondary students improves in the higher grades. It is also higher for the secondary students coming from families of higher income groups. Male and Female students exhibit similar level of Multiple Intelligence score.

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**MEASURING W ANGLE FOR SAGITTAL DISCREPANCY AND COMPARING IT WITH ANB, BETA ANGLE AND WITTS ANALYSIS**

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**ABSTRACT**

**Introduction:** The evaluation of sagittal jaw relationship between maxilla and mandible has been one of the major problem in the field of orthodontics, which is of prime importance in diagnosis and treatment planning. This is because of rotations of jaws during growth, vertical relationships between the jaws and reference planes, and a lack of validity of the various methods proposed for their evaluation

**Aim & objectives:** The purposes of this study is to measure w angle for skeletal discrepancies and comparing it with ANB angle beta angle and witts analysis

**Material & method:** A sample size of 30 patients will be screened in the orthodontic department of Inderprastha dental college and hospital.

**Result:** The mean value for the W angle in the Class I skeletal pattern group was 49 degrees, whereas the mean values in the Class II and III skeletal pattern groups were 47 and 50, respectively. The one-way ANOVA testing showed that there was a statistically significant difference between the mean values of W angle significant of the three groups

**Conclusion:** A new angle, the W angle, was developed as a diagnostic tool to evaluate the AP jaw relationship more consistently

**INTRODUCTION**

The evaluation of Sagittal jaw relationship between maxilla and mandible has been one of the major problem in the field of orthodontics, which is of prime importance in diagnosis and treatment planning. This is because of rotations of jaws during growth, vertical relationships between the jaws and reference planes, and a lack of validity of the various methods proposed for their evaluation.<sup>1</sup>

Downs in 1948 introduced the A-B plane angle. Positive and negative signs were used to denote protrusion and retrusion of mandible. A few years later Riedel in 1952 introduced ANB angle and It became the most commonly used. However, both Down's and Riedel's methods are subject to error due to the variations in the position of nasion which is not fixed during the growth, and any displacement will be directly affecting the A-B plane angle and ANB angle. As an alternative to ANB Jacobson introduced Wits appraisal in 1975.

It relates points A and B to the functional occlusal plane. The distance between the points of intersection AO and BO is measured to describe antero-posterior relationship. In females, AO should coincide BO, whereas in males BO should be 1mm ahead of AO. Though Wits appraisal avoids point N, accurate identification of functional occlusal plane is not easy or accurately reproducible, especially in mixed dentition patients. Secondly, any change in the angulation of functional occlusal plane, which is caused by either tooth eruption or dental development orthodontic intervention, can profoundly influence Wits appraisal. Baik and Ververidou in 2004 introduced the beta angle. Though, it assesses sagittal discrepancies, it depends on points A and B, which are difficult to locate and point C in condyle which is not clearly visible either to overcome these problems Bhad et al (2011) developed W-angle.<sup>2</sup>

It does not depend on any unstable landmarks or dental occlusion and would be especially valuable to assess true sagittal changes because of growth and orthodontic treatment<sup>3</sup>. So the purpose of this study is to compare the various angles ANB angle.<sup>4,5</sup> Comparison of different angular measurements to assess sagittal Jaw discrepancy in Wits appraisal, and W-angle used to measure antero-posterior discrepancy and to find out which is the most reliable amongst them<sup>6,7</sup>

**Aim**

The purposes of this study is to measure w angle for skeletal discrepancies and comparing it with ANB angle beta angle and Wits analysis

**HYPOTHESIS**

No difference in cephalometric measurement in class I, II, III skeletal pattern

## MATERIAL & METHOD

The study was undertaken at Inderprastha Dental College & Hospital where the samples were assigned to the Classes I, II, and III skeletal pattern of individuals between 15 and 25 years groups. After the initial selection, all x-rays were retraced; the ANB and Beta angles and the Wits appraisal were measured, Standardized pretreatment lateral cephalogram of 30 subjects (10 each class I, II, III) coming to the Department of Orthodontics and Dentofacial Orthopedics, Inderprastha Dental College and Hospital, Kodak 8000C (Digital panoramic and cephalometric system) and an exposure time of 13 seconds at 71kV (p) and 10 mA with the patient in natural head position. All the cephalogram were traced on to a 0.003 inch acetate paper using a 0.5 mm lead pencil under same illumination. Data collected were inserted in Excel (Microsoft, Redmond, Washington, USA). Collected data were screened for any missing values or outliers and for validity of distribution assumptions. To summarize the data, means and standard deviations of W angle in three groups were calculated.

## RESULT

**Table 1:** Data subjected to ANOVA

VARIABLES	CLASS I Mean value	CLASS II Mean value	CLASS III Mean value
ANB	2.2	5.6	0.4
WITTS	2.2	4.4	-2.8
BETA	42+8	33+6	44+8

The one-way analysis of variance (ANOVA) was used to determine whether there was a statistically significant difference between the mean values W angle of significance in the three groups. A P value  $\leq 0.05$  was considered to be significant mean values of w angle

**Table 2**

VARIABLE	CLASS I	CLASS II	CLASS III
W ANGLE	49	48	53

**Table 3:** Pearson's co-relation

VARIABLE	ANB	WITTS	BETA
W ANGLE	-0.31	-0.62	-0.47
Significance	0.3	0.06	0.1

The mean value for the W angle in the Class I skeletal pattern group was 48-52 degrees, whereas the mean values in the Class es II and III skeletal pattern groups were 47 and 53, respectively. The one-way ANOVA testing showed that there was a statistically cant difference between the mean values of W angle significant of the three groups

## DISCUSSION

In orthodontic diagnosis and treatment planning, evaluation of the Antero-posterior jaw relationship is an indispensable step. Both angular and linear cephalometric variables have been proposed to analyze sagittal jaw relationship and jaw position. This study attempted to analyze different cephalometric parameters which were used to indicate the sagittal jaw relationship in Classes I, II, and III malocclusions and also to compare W angle with those other parameters in assessment of sagittal jaw discrepancy. These variables can be erroneous as the angular variables can be affected by changes in facial height, jaw inclination, and total jaw prognathism, whereas linear variables can be affected by the inclination of the reference line. In the current study, three angular and two linear variables had been used to assess the antero-posterior jaw relationship. ANB, W angle, Beta angle were the three angular variables and Wits appraisal was the linear variables. W angle was found significant in assessing the antero-posterior discrepancy Each of the parameters had their own demerits, To overcome some of the limitations of the previously discussed parameters, the W angle was developed. This measurement does not depend on unstable landmarks or the functional occlusal plane. It uses three stable points — point S, point M, and point G. W angle is measured between a perpendicular line from point M to the S – G line and M – G line. Based on statistical analysis, a patient with a W angle 48-53 degrees has a Class I skeletal pattern. Patient with a W angle less than 48 degrees has a skeletal Class II pattern and one with a W angle greater than 53 degrees has a skeletal Class III pattern

## CONCLUSION

1. Previously established measurements for assessing the sagittal jaw relationship can often be misleading.
2. A new angle, the W angle, was developed as a diagnostic tool to evaluate the AP jaw relationship more consistently.

3. Subjects with a W angle 48-53 degrees have a Class I skeletal pattern; a W angle less than 48 degrees indicates a Class II skeletal pattern and a W angle greater than 53 degrees indicates a Class III skeletal pattern

#### LIST OF TABLES

<b>TABLE 1</b>	Data subjected to ANOVA
<b>TABLE 2</b>	Mean value of W angle
<b>TABLE 3</b>	Pearson's co-relation

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**ETHICS IN BUSINESS - THEORY AND PRACTICE**

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**ABSTRACT**

*There has always been a debate as to what is right and what is wrong and people differ when it comes to morality, values, ethos and ethics. The commonality perhaps in these is a quest for morally correct and ethically upright behaviour that every society seeks to achieve for the good of society and mankind. The erosion of human values, materialism and unrest are serious concerns. The businesses also have started noticing the downfall of great empires due to unethical practices and loss of public support. The organizations that have transparent norms and display of ethically right principles have survived longest and hold public faith and respect. Business Ethics is the study of the policies of an organization that are related to corporate governance and corporate social responsibility. It is the moral responsibility of the businesses to assure to provide the true value of its money to its public, stakeholders, customers and the Government. The paper exposes readers to the ethical perspectives in business, unethical practices by few case studies and why being ethical in business is pivotal to attract youth to enter the world of business. They help in endorsing a methodical and disciplined corporate life and society, thus shaping the culture of the individual firm, society, nation and the world at universal level. Business Ethics in managing an organization are vital for long-term survival.*

*‘The first step in the evolution of Ethics is the sense of Solidarity with other human beings’ –Albert Schweitzers*

**INTRODUCTION**

Business Ethics is the study of business situations, activities and decisions where issues of right and wrong are addressed. According to Raymond C. Baumhart, ‘The ethics of business is the ethics of responsibility. The businessman must promise that he will not harm knowingly’. The fundamental ethical issues in business include promoting conduct based on integrity and trust, but more on other complex issues that comprise of accommodating diversity, empathetic decision-making and compliance and governance that is consistent with the organization’s core values. Moral Principles that govern a person’s behavior or the conducting of an activity. Ethics is a concept about moral values and rules. Understanding of the Dilemmas at an individual level and Ethics at institutional Level.

**‘What is being Ethical and how to practice the good of society?’**

For this, we need to build an understanding about what is being Moral and what is being Ethical?

Moral dilemmas are situations in which decision-maker must consider two or more moral values or duties but can only honor one of them; thus, the individual will violate at least one important moral concern, regardless of the decision ....

In a false dilemma, the choice is actually between a right and a wrong.

**Examine these situations- what will you do?****Imagine yourself in the ROLE**

1. My Maths Teacher has wrongly given me final grade/Marks on the higher side...

**Should I point it out to the teacher or accept as good fortune quietly and gratefully?**

2. While parking the car in a narrow space, you dented the neighbor's car. Its night time, no one is around.

**You inform the neighbor, apologize and be ready to pay damages, or you leave quietly?**

3. Janaki knows that her parents will not allow her to go to the evening party, her parents are out of town.

**Should she lie about it or still ask her parents?**

4. Students joyfully pick bags/belongings of teachers.

**Would you allow this practice or stop it as it is not right and politely make them understand?**

5. Your friend is indulging in drugs

**You choose to stay away from her /him or report it to teacher and family?**

6. Student has not done the homework and instead of knowing the reason –

You start shouting and throw his notebook.

7. Your student complains about a teacher who touches her inappropriately,

**You tend to ignore or take the matter up to concerned authorities and save the child?**

Likewise, we daily face number of situations where we have to take a decision whether right or wrong.

*Here the decisions are by your own set of morality or what you think is right despite it may be rejected by others.*

They are influenced by your own beliefs and values.... MORALITY

The five major principles -autonomy, justice, beneficence, nonmaleficence and fidelity are such absolute truths in and of themselves.

**What is then ETHICS?**

Ethics is not merely about morality, but about the establishment of transparent norms of interrelationships. Morality can be individual set of commitments and a person can live with them even when they are rejected by others. **But one cannot be ethical alone.** Ethics brings in 'other people' for the realization of one self.

WHAT is Happening around us in society during COVID?

Where can it lead to?

How to build the Morality at Individualistic level and as ETHICS at SOCIETAL Level in any organization

**Ethics have universal value, and they flow from code of conduct/Rules and regulations.**

Ethics-1. Personal /Individual 2. Professional

General Ethics and Professional Ethics –Doctors, Lawyers, Business, Teachers

Such ethical questions/dilemma one is always confronted with in day- to- day life situation,

**A businessman is also confronted with such ethical questions like:**

- Should he disclose all information about his product? **For example**, a pharmaceutical company should disclose all information regarding ingredients, manufacturing date, expiry date and also the side effects one may have after using the medicine.
- Appointment of personnel by open selection process or by known relatives?
- Price Fixing, Price Discrimination, Price -Skimming
- Content of Advertisements: Products regarded as Immoral or Harmful
- Children and Marketing: Marketing in Schools
- Black Markets
- Carbon Emissions Trading
- Misleading Financial Analysis, Creative Accounting
- Securities Fraud, Forex Scams: Manipulation of the Financial markets
- Excessive payments made to corporate CEO's and top management
- Bribery, kick- backs, accounting scandal-Enron, World Com Satyam Issues affecting the privacy of employee's union busting, strike breaking, drug testing and hiring and firing of employees based on race, age, gender, religion or any other discriminatory act.
- Patent infringement, copyright infringement and trade infringement – misuse of intellectual property

Study the Similar Situations given below for more insight:

Going through the entire list, you may say 'oh.' This is not ethical, not right and one must protest and there should be some mechanism which should save people and society against these unethical practices.

*Where a businessman / firm are faced with a situation of thinking 'what is right?' or 'what is wrong, whenever a decision or action is to be taken. Though it is not always easy either to define what is ethical or what is not. It is also usually difficult to stick to uniform standards of ethics in practice*

This is the right context where the Business Ethics or the CSR; an umbrella term under which the ethical rights and term and duties existing between companies and society are debated. ***Business Ethics (also known as Corporate Ethics) is a form of Applied Ethics or Professional Ethics that examine Ethical Principles and Moral or Ethical Problems that arise in a Business Environment.*** It applies to all aspects of business conduct and is relevant to the conduct of individuals and business organizations as whole. Applied ethics is a field of ethics that deals with ethical questions in many fields such as medical, technical, legal and business ethics. ***Ethics represent the moral and social system for individual and organizations.*** They help in endorsing a methodical and disciplined corporate life and society, thus shaping the culture of the individual, firm, society, nation and the world at universal level. ***Business Ethics in managing an organization are vital for long term survival.***

### WHAT ARE THE ETHICAL ISSUES IN BUSINESS?

Ethical issues in business encompass vast areas within an organizational ethical standard. According to the Global Business Ethics Survey of 2019 ,25% of employees still feel that their senior managers do not have a good understanding of key ethical and compliance business risks across the organization. In order to manage the ethical issues in business that arise in the organization, thorough understanding needs to be developed to detect and most importantly, deter these issues before they become problematic.

To explore more, find the following situations through this activity –

#### Activity

1. Classify the Cases/Situations given above in the box which are ethically upright behavior and which of these are unethical behavior. Why do you think so?
2. Think of the cases where you consider it was ethical or unethical and give arguments/reasons in support of your answer. May take help of your brother/sister/friend or relative working in the corporate for examples pertaining to business.
3. ***Marketing in' Schools', 'Carbon Emissions*** 'Do you think these are ethical or unethical?

Give reasons in Support of your Answer.

As an academic discipline, Business Ethics emerged in the 1970s. Higher interest in business ethics was observed after several corporate scandals in the earlier 2000. As of 2009, sixteen academic journals devoted to various business ethics issues and are continuing to do so even now.

All the examples/instances given in the box above come under:

- **General Business Ethics** – overlaps with the philosophy of business i. e. maximizing profits vs. interests of various stakeholders.
- **Ethics of Accounting and Financial Information** i. e. Creative Accounting, Misleading Financial Analysis
- **Ethics of Human Resource Management** – covering those ethical issues arising around the employer/employee relationship, such as rights and duties owed between employee and employees.
- **Ethics of Sales and Marketing** – overlaps strongly with media ethics, because marketing make heavy use of media. Anti -competitive practices, specific marketing strategies, planned obsolescence etc. disinformation, advertising techniques, false advertising, advertising regulation etc. all covered under this.
- **Ethics of Production** usually deals with the duties of a company to ensure that product and production processes do not cause harm (e.g. Tobacco, alcohol, weapons, motor vehicles, chemical manufacturing, bungee jumping etc.), product testing ethics: animal rights and animal testing etc.
- **Ethics of Intellectual Property, Knowledge and Skills** – knowledge and skills are valuable but not easily ownable as objects. Nor is it obvious that has the greater rights to an idea: the company who trained the employees or the employee themselves? The country in which the plant grew, or the company which discovered and developed the plants' medicinal potential as a result attempts to assert ownership and ethical disputes over ownerships arise. For example, Piracy of original film or CD before they are shown on cinema halls.

(Cases: ***Private versus Public Interest in the Human Genome Project***)

- **Ethics and Technology** –The computer and World Wide Web are two of the most significant inventions of the twentieth century. There are many ethical issues that arise from this technology. It is easy to gain access to information. This leads to data mining, workplace monitoring and privacy invasion. On – line credit cards frauds are common examples of the same.

In the increasing competition focused marketplaces of 21<sup>st</sup> century, the demand for more ethical business processes and actions is assuming more importance. Simultaneously pressure is applied on industry to improve business ethics through new public initiatives and laws business can often attain short – term gains by acting in an unethical fashion, however, such behaviors tend to undermine the economy over time. The range and quantity of business ethical issues reflects the degree to which business is perceived to be at odds with non-economic social values. Historically, interest in business ethics accelerated dramatically during the 1980s and 1990s both within major corporations and within academia. For example, today most major corporate websites lay emphasis on commitment to promoting non-economic social values under a variety of headings like Ethic Codes, Social Responsibility Charters. In some cases, corporations have redefined their core values in the light of business ethical considerations.

Hence, all the ethical issues can be examined from various new perspectives,

Often situations arise in which there is a conflict between one or more parties such that serving the interest of one party is detrimental to the other (s). For example, a particular outsourcing might be good for the employee, where as it would be bad for the company, society, or vice versa. Some ethicists (*e. g. Henry Sedgwick*) see the prime role of ethics as the harmonization and reconciliation of conflicting interests. Theorists contend that a business has moral duties that extend well beyond serving the interest of its owners or stakeholder and that business has moral responsibilities to so-called stakeholders, people who have an interest in the conduct of the business, which might include, employees, customers, vendors, the local community or even society as a whole.

Ethical issues can arise when companies must comply with multiple and sometimes conflicting legal or cultural standards, as in the case of multinational companies that operate in countries with varying practices. The question arises, for example, ought a company to obey the laws of its home country, or should it follow the less stringent laws of the developing country in which it does business? To illustrate United States law forbids companies from paying bribes either domestically or overseas; however, in many parts of the world, bribery is a customary, accepted way of doing business. Similar problems can occur with regard to child-labour, employee safety, work hours, wages, discrimination, and environmental protection laws.

***It is sometimes claimed that a Gresham's law of ethics applies in which bad ethical practices drive out good ethical practices. It is claimed that in a competitive business environment,*** those companies that survive are the ones that recognize that their only role is to maximize profits.

Also, with the transitioning economies moving towards more transparent and democratic systems, the existence of policies such as code of ethics that attempt to monitor and control normal behaviour are becoming increasingly important. The recent initiative taken by ministry of corporate affairs is one important step in corporate governance; wherein, it has set up a “Senior Fraud Office (SFO) under its jurisdiction to detect and prevent corporate frauds. It is not an independent body and, therefore, is prone to political interference.

Satyam Computer Services Ltd. corporate fraud worth Rs. 7000/ crore will leave an impact on perception about corporate governance levels in India. While India continues to rank high in terms of CG, the Satyam case has brought to fore a few questions on implementation glitches.

To show how the basic principles of ethics are relevant to businesses, a case study of Merck and company is given below, how they dealt with the problems of developing a drug that was potentially lifesaving but which presented them with little, if any, chance of earning a return on their investment.

#### Case Study-1

##### Merck and Company

The drug was Ivermectin, one of their bestselling animal drugs. The potential market for the drug was those suffering from river blindness an agonizing disease affecting about 18 million impoverished individuals in Africa and Latin America. The disease is particularly horrendous: worms as long as two feet curl up in nodules under an infected person's skin, slowly sending out offspring that cause intense itching, lesions, blindness, and ultimately death. (Though many sufferers actually commit suicide before the final stage of the disease)

The need for the drug was clean. However, the victims of river blindness were almost exclusively poor. It seemed unlikely that Merck would ever recover the estimated \$ 100million it would cost to develop the human version of the drug. Moreover, if there proved to be adverse human side effects, this might affect sales of the very profitable animal version that were \$ 300 million of Merck's \$ 2 billion annual sales. Finally, congress was getting ready (USA Legislative) to pass the drug regulation act, which would intensify competitions in the drug industry by allowing competitors to more quickly copy and market drugs originally developed by other companies.

**Source:** Velasquez M (2002): *Business Ethics; concepts and cases (5<sup>th</sup> Edition)* India: person education.

Question

**Was Merck morally obligated to develop this drug?**

\*Their managers felt, ultimately, that they were, they even went so far as to give drug away for free. This story seems to run counter to the assumption that given the choice between profits and ethics, companies will always choose the former. The choice however, may not be as clearcut as this dichotomy suggests. Some have suggested that, in the long run, Merck will benefit from this act of kindness just as they are currently benefitting from a similar situation in Japan.

Even so most companies probably not invest in an R & D project that promises no profit and same companies often engage in outright unethical behaviours. Still habitually engaging in such behaviour is not a good long-term business, strategy.

A more basic problem is that the ethical choice is not always clear. Merck, as a for-profit corporation, has responsibilities to its shareholders to make a profit. Companies that spend all their funds on unprofitable ventures will find themselves out of business.

Study the details of another famous company which faced the consequences of unethical practice.

**Case Study –2**

**Satyam Computer Services Ltd. Saga**

The latest in news was the Satyam saga, wherein Chairman Ramalinga Raju resigned after notifying board members and the securities and exchange board of India (SEBI) that the company's accounts had been falsified.

The balance sheet fabrication involved inflated cash and bank balances of Rs 5,040 crore as against Rs 5,361 crore reflected in the books, a non-existent accrued interest of Rs. 376 crore, an understated liability of Rs. 1,230 crore, an overstated debtors' position of Rs. 490 crores as against Rs. 2,651 crores in the books. The actual number of employees was only 40,000 against reflected 53,000. A marginal gap between actual operating profit and the one reflected in the books of accounts continued to grow over the years and attained unmanageable proportions as the size of company operations grew significantly. The aborted Maytas acquisition deal was the last attempt to fill the fictitious assets with real ones. A show-cause notice to Satyam's auditor Price Waterhouse Coopers (PWC) was issued by Institute of Chartered Accountants of India, on the accounts fudging. The auditors, proclaimed that their audit reports may have been rendered "*inaccurate and unreliable*" because of their reliance on potentially false information provided by the management of Satyam.

In 2008, the coveted Golden Peacock Award for Corporate Governance under risk management and compliance issues was awarded to Satyam but was stripped from them in the aftermath of the scandal. Satyam debacle has been termed as India's own Enron scandal by analysts in India.

Questions

1. Analyse the details of the case. State what according to you is unethical in this case? Give arguments in support of your answer.
2. Collect information about the Enron scandal mentioned in the case study given above and state the unethical issues in the case by giving arguments in support of your answer.

Ethics represent the moral and social system for individual and organizations. They help in endorsing a methodical and disciplined corporate life and society, thus shaping the culture of the individual, firm, society, nation and the world at universal level. Business ethics in managing an organization are vital for long term survival.

It is noteworthy that business ethics are not confined to domestic terminal limits but with the globalization, privatization and liberalization, these have relevance in the international / global context as well more so when we have multinational in our country and the companies we have abroad.

#### *International Business Ethics and Ethics of Economic System*

##### International Business Ethics

While Business Ethics emerged as a field in the 1970s International Business Ethics did not emerge until late 1990s, looking back on the international developments of the decade. Many new practical issues arose out of the international context of business. Theoretical issues such as cultural relativity of ethical values receive more emphasis in this field. Other, older issues can be grouped here as well.

##### ***Issues and Sub-fields include:***

- The search for Universal Values as a basis for International Commercial Behaviour.
- Comparison of business ethical traditions of different countries. Also, on the basis of their respective GDP and [Corruption rankings].
- Comparison of business ethical traditions from various religious perspectives.
- Ethical issues arising out of international business transactions; e.g., ***bio prospecting and bio piracy in the pharmaceutical industry; the fair-trade movement; transfer pricing.***
- Examples as the end.
- Issues such as Globalization and Cultural Imperialism.
- Varying Global Standards – e.g., the use of Child Labour.
- The way in which multinationals take advantage of international differences, such as ***outsourcing production (e.g., clothes) and services (e. g. call centres) to low-wage countries.***
- The permissibility of international commerce with pariah states.

Foreign countries often use dumping as a competitive threat, selling products at prices lower than their normal value. This can lead to problems in domestic markets. It becomes difficult for these markets to compete with the pricing set by foreign markets. In 2009, the International Trade Commission has been researched on the anti-dumping laws. Dumping is often seen as an ethical issue, as larger companies are taking advantage of other less economically advanced companies.

##### Ethics of Economic System

This vaguely defined area, perhaps not part of but only related to business ethics, is where business ethicists venture into the field of political economy and political philosophy, focusing on the rights and wrongs of various systems for the distribution of economic benefits. John Rawls and Robert Nozick are both notable contributors.

##### ***OTHERS-***

- Business culture
- Bribery
- Business ethics Quarterly
- Business law
- Corporate behaviour
- Corporate crime
- Corporate social entrepreneurship
- Corporate social responsibility
- Corruption
- Ethics'

- Ethical implications in contracts
- Ethical consumerism
- Ethical code
- Ethical job
- Fiduciary
- Journal of business ethics
- Management
- Organizational ethics
- Optimism bias
- Strategic misrepresentation
- Strategic planning

Companies care about the ethics of their managers and employees. Managers who embezzle large sums of money can destroy a firm. Also, substantial penalties can be levied if employees lie to customers, misrepresent the features or risks of the products being dealt in by the organization. Besides, firm care about the ethics of their customers. Retail stores suffer huge losses each year due to shoplifters. These ethics commonly known as business ethics or corporate ethics refer to the application of ethical principles to business relationships and activities, thus, governing the way a business runs and carries out its operations.

Business ethics apply to all aspects of business conduct and are relevant to the conduct of individuals and business organizations as a whole business can often attain short term gains by acting in an unethical fashion; however, such behaviour tends to undermine the economy over time. The range the quantity of business ethical issues reflects the degree to which business is perceived to be at odds with non-economic social values.

World witnessed the largest meltdown and cannot forget the famous case of Lehman Brothers which was a global financial firm that provided investment banking, trading, brokerage and other services. It was the fourth - largest investment bank in the United States. Its collapse is regarded as deepening the 2008 financial crisis and is considered one of its defining moments.

See an example where renowned cosmetic company has shown remarkable work in fulfilling its social obligations towards society:

### Case Study 3

#### Shahnaz Husain Group of Companies

Mission statement of Shahnaz Husain is “Empowering lives has been the motivation for all our endeavors. Bestowing joy, happiness and fulfilment in other person’s life, renders definite emancipation of the heart and soul. Promoting India’s Herbal Heritage abroad and in India provides me food for thought – Shamute and Shasight will provide me food for my soul’.

#### BEAUTIFYING THE WORLD OF THE SILENT AND SIGHTLESS

Junior high school students in Chicago were studying the Seven Wonders of the World. At the end of the lesson, the students were asked to list what they considered to be the Seven Wonders of the World. Though there was some disagreement, the following received the most votes:

1. Egypt’s great pyramids, 2. The Taj Mahal, India, 3. The Grand Canyon, Arizona
3. The Panama Canal, 4. The Empire State Building, 5. St. Peter’s Basilica
6. China’s Great Wall

While gathering the votes, the teacher noted that one student, a quiet girl, hadn’t turned in her paper yet. So, she asked the girl if she was having trouble with her list. The quiet girl replied, “Yes, a little. I couldn’t quite make up my mind because there were so many”.

The teacher said, “Well, tell us what you have, and maybe we can help.” **The girl hesitated, then read, “I think the seven wonders of the world are:**

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**to touch, to taste, to see, to hear ... (She hesitated a little, and then added.) to feel, to laugh, and to love.**

The room was so quiet; you could have heard a pin drop.

May this story serve as a gentle reminder to all of us that the things we overlook as simple and ordinary are often the most wonderful – and we don't have to travel anywhere special to experience them.

Where CSR is concerned, some people are of the opinion that doing something for differently baled goes beyond charitable activities, like making donations for the underprivileged.

This principle has been adhered to by Shhanaz Husain Group of Companies since decades.

#### **The Journey Began Long Back**

In 1979, Shahnaz Husain started to train ordinary housewives to set up herbal beauty salons in their own homes, and under a franchise agreement gave them the right to use her name and products. This helped many women to have a career and still be close to home and family. Many a shy, submissive women have blossomed into confident entrepreneurs.

The other aspect of Hussain's business model is its emphasis on herbal products, which she considers to be a part of her CSR policies. According to her, she has even refused to offer treatments such as skin bleaching creams or hair perms to highlight the dangers of chemical substances. She has brought focus of the world to the rich Indian herbal heritage and treatments based on the Ayurveda system. She has reinforced her philosophy that nature is the best cosmetologist.

Through the years the groups have become a symbol of strength for the marginalized, especially women. With the time, its CSR ventures have bifurcated to the cause of more depressed and differently abled among the women itself.

#### **'Shamute' and 'Shasight': Lighting up lives**

Keeping its mission of corporate social responsibility aloft the corporate group started "Shahnaz Husain International Beauty Academy" which dedicates itself to social causes and has shown immense commitment towards empowering the less privileged section of the society through 'Shamute' and 'Shasight', free training course to the deaf, mute and blind students. The students are so well trained that they are absorbed into the market instantly. Unlike regular assumptions, a deaf, mute and blind individual secures a better job than others. They are gifted in higher sensory perception that enables extra attention to pressure points for beauty therapy massages and hence, gives them an added edge of perfection compared to their counterparts.

The institute was set up as a way to facilitate career opportunities for these women. There are four months courses round the year with fifteen students per batch. Free of cost, the courses are open to everyone, subject to availability. The training is conducted free and at the end of the course the girls are given a diploma. This gives them an opportunity to find jobs in other beauty salons or work for any Shahnaz Husain salon.

***This also means to earn a livelihood and be financially independent.***

#### **A Lesson in CSR:**

*The focus is to improve the lives of differently abled by making them self-reliant. Mostly the differently abled people are coached in those fields in which the sense of sight is not at all required. But Shahnaz took a bold initiative by training them in those areas to perfection which required a great deal of use of five senses. This adds all the more to self-respect of these people and the best part is that there is no dearth of jobs.*

Many exemplar businesses by illustrious personalities like Tatas, Narayan Murti have built empires but they built it on trust, care and share and on sound principles of ethics that have stood them apart from other businesses. The acceptance, trust and respect are phenomenal. Find few facts –

Tata Jamsetji Tata started with his project by opening Hotel in 1903 have built an empire over the years and has established many companies' world over. They have worked on the social front too. They have worked on Child rights and environment conservation. It is one of the 30 countries in the world who have worked on protecting child rights .



### CASE STUDY -STORY OF TATA

**Founded in 1868, by Jamsetji Nusserwanji ,Tata the Tata Group is a global business conglomerate operating in over 100 countries across 5 continents.He had four goals in life:**

- **Setting up an iron and steel company,**
- **A world-class learning institution**
- **A unique hotel**
- **A hydro-electric plant.**



### GOAL OF SETTING A UNIQUE HOTEL

**Taj Mahal Hotel at Colaba waterfront in Mumbai on 3 December 1903 at the cost of 11 million (worth 11 billion in 2015 prices).**

**At that time, it was the only hotel in India to have electricity.**



### WOMAN ENTREPRENEUR

#### NAMCHI DESIGNER CANDLES-ANOTHER CASE STUDY

**Namchi Designer Candles has been receiving numerous awards such as North-East Women Entrepreneur of the year 2015-2016 for Sikkim, and Sreemanta Shankar Mission of Guwahati on 26th April 2018 at New Delhi.**



Namchi designer candles -A CSR initiative of NEDFI -Smita Rai, belonging to Namchi District in South Sikkim who converted her passion making designer candles for gifting to friends and relatives. In 2012, with the help of North Eastern Development Financial Institution that worked for the organisations who had innovative ideas and provide employment to poor people. she formed a designer candle making company that gave employment to thousands of women for making them self-reliant. Namchi has 100% women employees.

Cases like these set an example that they have put people's concerns above the sole aim of profits maximization. Quality management, taking care of its employees, skilling them are at core of the companies who believe in running the organization on ethical lines. Society have noticed the downfall and decay of big companies who were not on ethical perspectives and were involved in malpractices. So, Business Ethics in managing an organization are vital for long- term survival.

**Satisfied Workers create satisfied workers through trust and transparency**, was the principle followed by Tata group of employees which has put the company on top at local and global level.

### **CONCLUSION**

Business Ethics refers to the moral practices and policies that guide decision making and managing effectively the controversial and other issues in a business. Society has been witnessing clashes and value conflicts which

is very disturbing for all especially the impressionable youth .Business on ethical lines is the need of the hour for attracting new talent ,building positive relationships customers and attracting new potential investors .Many famous business ethics cases like Enron scandal , Volkswagen emissions scandal , BP scandal , Valeant Pharmaceuticals scandal ,Uber scandal, Facebook scandal and Apple scandal give insight as to how running business on ethical lines is must and just for long time survival and public acceptance in society . Seven principles of Business Ethics: Accountability, Care and Respect, Honesty, Healthy Competition, Loyalty ,Transparency and Respect for the Rule of Law lay down the ethical fabric in society to repose their faith in Business .It helps improving the brand image ,motivating employees and safeguarding businesses from future legal action .Finally an organization 's approach to Business Ethics is the foundation upon which its trust is built in society .Thus the right set of Business Ethics is essential for business growth .

***“Change the lives to the core if you take onus!”***

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**MORAL VALUES AND ETHICS: IMPERATIVE TO OVERALL DEVELOPMENT OF STUDENTS**

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*In the contemporary world, the ethics and moral values plays an important part in the overall development of a student's personality. Here in this article, we tried to review the different parameters and factors which influences the moral values and ethics in students' lives. We can see how in today's world, it's easy to lose sight of one's core values. It is also learnt that given the modernization and increased complex situations in an individual's life, developing a strong moral compass and ethical understanding is the way to go.*

*It is seen that moral values and ethics helps in building character, gives an improved perception of the world, helps students counter bad influence from peers and helps them to cope with difficult situations. Overall, this article reiterates the fact that moral values and ethics are important to a student's development.*

*Key words: Ethics, moral values, personality, modernization, perception, development*

**INTRODUCTION**

“Always do what is right. It will gratify half of mankind and astound the other.”— Mark Twain.

A student's life revolves around learning and exploring the world, an endeavor that as common and vital as it is, can often be trickier than meets the eye. Navigating the modern age comes with its own complexities. With increased access to the world and beyond, there arise unforeseeable problems. This is where moral values and ethics step in as building blocks of life. Their inculcation in students helps them develop a moral compass that in the long run assists them in staying off the negative influence of social media, peers, and society in general. For a student in his nascent stage, developing a strong character with an absolute sense of right from wrong and an understanding of values like gratitude, compassion, integrity etc. is crucial, for it lays the foundation for a bright future.

Before we move on to see how moral values and ethics contribute to an overall development of students, let us review what these terms stand for.

**DISCUSSION:**

Moral values are the goals, behavioral practices and habits that are validated by the society we live in. This set of values is imbibed in our behavior through a long process of observation, education, conditioning and social guidelines. These are usually universal and may not vary much in different parts of the world. For instance, no matter which community, religion, or region you belong to, moral values such as truthfulness, loyalty, courage, faith, and honesty hold the same importance.

Moral values concern themselves with right and wrong. They additionally characterize, what is socially satisfactory, great and wickedness. These are ideas that society considers important. They are at play when an individual interacts with the wider world or has to make a decision that have consequences affecting others.

At its most straightforward, ethics is an arrangement of moral principles. They influence how individuals decide and have their existences. Ethics is concerned with what is great for people and society and is like depicted as moral way of thinking. It analyzes the judicious support for our ethical decisions. It reviews what is morally right or wrong, just or unjust. It can be said that in general, ethics focuses on human independence with respect to the relationship that exists between humans and the world. This independence forms the primary condition in ethical decision-making and in any objective analysis of the facts.

Moral values and ethics go hand in hand. An individual who knows the difference between right and wrong, chooses right is moral, and an individual whose morality is evident in his willingness to do the right thing, even when it is difficult or dangerous, is ethical. Ethics are essentially moral values in action.

Let us now see how the dynamic duo of moral values and ethics help shape a student's development in four most important ways.

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**1. Builds Character**

Having a deep sense moral integrity and ethical sensitivity is necessary in the definition of your character. They set boundaries that help an individual demonstrate appropriate behavior towards self and others and make choices that are respectful and thoughtful of all life and the environment. This results in more peaceful relationships with others and overall harmony.

Our character is a combination of the moral values and ethics that we have been taught, as well as values that include work ethics, education, hobbies, and so on. In addition to these, your interactions with others and their influences also help to mold and shape an individual's character, shaping you into the person you are today.

**2. Helps change their perception of the world**

The discussion of this topic brings us to the question of what the consequences are when students make their moral and ethical judgements? One important consequence may be that these judgments of moral and ethical dilemmas affect how others view them, thereby affecting their own view of the world in return. And in their former years, a warped sense moral and ethical reasoning can lead to discontentment and inability to keep up with the pace of the world.

However, all things put considered, there is one thing that all individuals collections, institutions, economies, countries and civilizations have in common, which when removed, can destroy the most successful businesses, most powerful governments, most progressive economies, the strongest and greatest relationships and the strongest character in the world. But when leveraged and exploited, it has the potential to produce massive victory and opulence in all aspects of human life. That one thing is trust, which is based on high moral and ethical standards.

**3. Counters bad influence from peers**

For children, their family, culture, and religion greatly influence their moral and ethical decision-making. However among adolescent students, peers have a much greater influence. Peer pressure can be a powerful influence because friends play a more significant role in teens' lives.

Furthermore, the new founded ability to think abstractly enables them to recognize that rules are not absolute, they are put in place by other people and created by other people. Accordingly, they start to scrutinize the outright power of guardians, schools, government and other conventional foundations.

By late adolescence, most of them are less rebellious because they have begun to establish their own identity, their own belief system, and their own place in the world.

Some youth who have arrived at the most significant levels of moral advancement might have an energetic outlook on their ethical code; thusly, they might decide to partake in exercises that exhibit their ethical conceptions too. For instance, some college students might sort out and take part in exhibits and fights while others might chip in their time for projects that advance the moral standards they hold significant.

This enables a cycle of improvement via peer-to-peer relationship which creates a positive change in the society. However, a strong moral and ethical understanding is what can catapult this change in the right direction.

**4. Helps them cope with difficult situations:**

The aim of moral values and ethics is not understanding the philosophy. The aim is to work on the personal satisfaction. Facing difficult situations in life is inevitable. Students, especially, are faced with difficult situations which demand them to make difficult choices.

However difficult a situation might be, making an immoral and unethical decision is exhausting. One wrong move snowballs into a series of bigger, more scandalous wrong decisions. This makes it difficult for students to cope with such situations, where more than often, a lot of them get stuck in a loop. However, taking an ethical and morally right stand, or taking a principled perspective on an issue, reduces their stress in the long run and helps them build confidence.

**CONCLUSION:**

Moral values and Ethics are the structural blocks of personality that assist in building the better character of an individual. It is absolutely important for students to learn, as it is then they make their most memorable strides towards life and it is important that they get everything done as need be. These ethical and moral ways of behaving shape their mentalities, convictions, thoughts and assist them with forming into strong and resilient individuals.

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We conclude the article by once again, emphasizing the contribution of moral values and ethics to a student's over-all development. In the absence of proper moral and ethical development, students may find it difficult to navigate through life, and this could lead to dissatisfaction. It makes it difficult for these individuals to participate in the society as valuable contributors. The only way to avoid this situation is the early development of moral values and ethics. But the responsibility of a student is not the mere understanding of these values, it is also the implementation of these set of values.

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**TO ESTIMATE THE PREVALENCE OF CANCER BURDEN IN JAGDALPUR, BASTAR DISTRICT CHATTISSGARH**

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**ABSTRACT**

*Introduction: Cancer and other noncommunicable illnesses are at risk from tobacco use, alcohol usage, poor diet, physical inactivity, and air pollution. Cancer risk factors can include some chronic infections; low- and middle-income nations are particularly affected by this. By avoiding risk factors and using currently available evidence-based prevention measures, between 30 and 50% of malignancies can now be avoided. Early cancer identification and adequate cancer treatment and patient care can both lessen the burden of the disease. If detected early and treated effectively, many cancers have a high chance of recovery.*

*Method: An observational research that was done in the past was done. The investigation was carried out at the Government Medical College in Jagdalpur, Chhattisgarh's Bastar district. The study lasted from APRIL 2021 until DECEMBER 2021. All of the subjects who were a part of this study provided their informed permission. There were 45 subjects in all. Participants that ranged in age from 30 to over 45 were both male and female.*

*Result: Twenty-five of the 45 individuals were female, and 25 were male. Twenty-three participants had oral cancer, fifteen had breast cancer, five had lung cancer, and two had stomach cancer. There were also fifteen subjects with breast cancer. Compared to other malignancies, there are more people who have oral cancer.*

*Conclusion: Any comprehensive cancer control strategy must include a plan for cancer detection and treatment. Its main goal is to either totally cure or significantly prolong the lives of cancer patients while ensuring a high quality of life.*

*Keywords: Prevalence, Cancer, Neoplasm, Public Health.*

**INTRODUCTION**

The World Health Organization (WHO) estimates that cancer ranks as the first or second leading cause of death before the age of 70 in 91 of 172 nations, and third or fourth in another 22 countries. After heart illnesses, it is the main cause of death worldwide. In comparison to patients in high-income nations, cancer patients in low- and middle-income countries—including India—generally have a poor prognosis due to a lack of cancer knowledge, delayed diagnosis, and unequal access to cheap curative services.<sup>1</sup>

Today, one of the leading causes of illness and mortality is cancer. Cancer caused 14.1 million new cases, 8.2 million cancer deaths, and 32.6 million cancer survivors in 2012. Cancer is not yet one of the top 10 main causes of mortality in emerging nations, although its incidence is rising there. India is currently going through an epidemiological change, which is evident in the country's rising non-communicable illness burden, including cancer.<sup>2</sup>

The National Cancer Registry Programme in India was started in 1981 to collect information from population-based registries on the prevalence and patterns of cancer. Under this effort, the number of registries has increased, and more population-based registries have recently been established. However, the majority of cancer registries in India are located in urban regions, and several populous states lack cancer registries at this time, making it challenging to determine changes in the population-level burden of cancer across the entire nation.<sup>3</sup>

Clinical and hospital records have been a significant source of data on the prevalence of cancer. Clinical and hospital records lack information about undiagnosed, subclinical malignancies in inaccessible areas compared to necropsy; the percentage of missed diagnoses varies on the present caliber of the clinical diagnosis but is significant in any scenario. The extra challenge of exactly identifying the base population covered—information required calculating prevalence rates—also exists. Contrarily, clinical records may provide the prevalence rate directly however, clinical and hospital records are also very selective and are particularly influenced by the area of speciality of the clinics covered; hence, the clinical records might also contain information that isn't in the hospital records.<sup>4</sup>

According to the International Agency for Research on Cancer, the number of new cases of cancer in India will rise from 1 million in 2012 to more than 1.7 million by 2035. This suggests that the number of cancer-related deaths will likewise rise throughout this time, from 680000 to 1- 2 million. Oral cancer and poor poverty are

linked, according to a case-control research from India. Oral cancer growth is influenced by variables such as poor diet, inadequate medical care, poor living conditions, and risky behaviors. The majority of the population in many low- and middle-income nations, including India, lacks access to a well-developed and well-regulated cancer care system.<sup>5</sup>

## METHOD

Retrospective observational study was carried out. The study was conducted in Government Medical College, Jagdalpur, Bastar district; Chhattisgarh. Based on clinical and hospital records the data was noted. Age, gender, ethnicity, and place of birth were sociodemographic factors that were documented. The sort of cancer the patient had presented with, such as breast, cervix, lung and stomach cancer etc., was noted down. Duration of the study was from APRIL 2021 to Dec 2021. Informed consent was taken from all the participants included in this study. The total number of subjects was 45. Both male and female's participants of age from 30 to above 45 were included. All participants' details and all data was anonymised and stored in a password protected computer. Statistical analysis for this study was done by using statistical software SPSS version 16.

## RESULT:

**TABLE 1: AGE AND SEX DISTRIBUTION OF STUDY SUBJECTS**

AGE	MALES	FEMALES
30- 34YEARS	4	3
35- 40YEARS	10	7
ABOVE 40 YEARS	11	10
TOTAL	25	20

Table 1 shows age and sex distribution of study subjects. The number of male subjects was 25 and female were 20. The total number of subjects was 45. Out of 45 subjects, 25 were males and 20 were females. From age group 30 to 34 years, the numbers of males were 4 and females were 3. From age group 35 to 40 years, the numbers of males were 10 and females were 7. From age group of above 40, the number of males was 11 and females were 10.

**TABLE 2: DISTRIBUTION OF TYPES OF CANCERS.**

TYPE OF CANCERS	NO OF SUBJECTS	%
ORAL CANCER	23	51%
BREAST CANCER	15	33%
LUNG CANCER	05	11%
STOMACH CANCER	02	5%

Table 2 shows distribution of types of cancers. The number of subjects with oral cancer was 23 and the numbers of subjects with breast cancer were 15, number of subjects with lung cancer was 5 and with stomach cancer was 2. The number of subjects with oral cancer are more compared to other cancers.

## DISCUSSION

The hazardous effects of tobacco should be emphasized, and its use should be discouraged. Additionally, we should educate the public about the importance of engaging in physical activity, avoiding obesity, eating a healthy diet, limiting exposure to harmful substances at work and in the environment, abstaining from alcohol use, getting vaccinated against the hepatitis B virus, and using safe sexual practices to prevent the development of cancer (Dins haw et al). The adult education programme should use the same methodology.<sup>6</sup>

Prostate cancer continues to be the most common cancer in North America, Oceania, Northern and Western Europe, and the vast majority of other countries in the world. Cervical cancer ranks second overall but first in terms of 5-year frequency in much of Sub-Saharan Africa and Southern Asia. Thus, breast, cervical, or prostate cancer is the most common type of the disease in almost all of the world's nations, highlighting the need for advances in patient care and service delivery that are aimed at managing those who have been diagnosed with these neoplasms.<sup>7</sup>

Activities aimed at preventing tobacco use in schools and colleges are given prominence by both India's tobacco prevention initiatives and the National Tobacco Control Cell. In India, tobacco is a subject that is covered in school curricula. All six of the tribal villages we studied had only four grades of instruction. Giving tobacco prevention advice in fourth grade, when pupils' average ages will be approximately nine, might be too soon. In addition, our study's typical tobacco user was older than 14 years old.<sup>8</sup>

The three main problems affecting this society are social prejudice, poverty, and illiteracy. The majorities of them are incredibly elusive and live in remote areas far from civilization. In addition, a town 15 kilometers outside the municipal limits is home to the people of our study. The population's low financial status, remoteness from other people and places, and their discernment restrict them from accessing healthcare treatments. They became dependent on local forms of self-care as a result. Most of them don't use allopathic treatments for minor or chronic ailments.<sup>9</sup>

The biggest burden was caused by male esophageal cancer, lung cancer, and breast cancer in the north and northeast, respectively. Data quality, data sources, data completeness (incidence and mortality), data collection time, technique, statistical modeling, and assumptions all have a significant impact on the estimates that are produced. However, because the NCRP follows to the standards set by the WHO-International Agency for Research in Cancer over the past 40 years, it is believed to give reliable data to estimate the national, regional, and state burden of cancer.<sup>10</sup>

## CONCLUSION

In our study among all types of cancers like oral cancer, breast cancer, lung cancer and stomach cancer etc, more number of oral cancers are identified compared to other type of cancers. A strategy for the detection and treatment of cancer is an essential part of any comprehensive cancer control strategy. Its primary objective is to either completely cure cancer patients or greatly extend their lives while ensuring a high quality of life. The state must enhance screening and treatment. It is necessary to have dedicated cancer institutes, diagnosis facilities, enough personnel resources, and palliative care facilities. Information regarding pertinent government initiatives has to be spread. The laws governing alcohol and cigarettes need to be tightened. Another way to improve detection rates is to expand the number of medical professionals who work in cancer screening across all hospitals.

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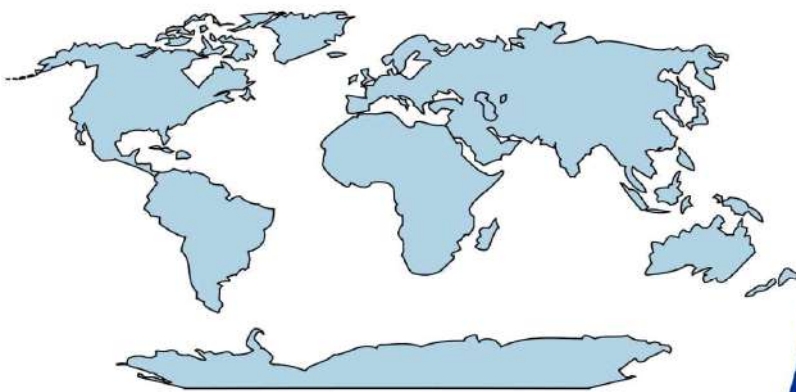
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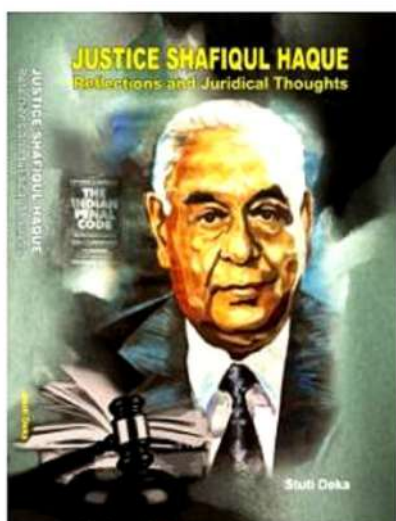


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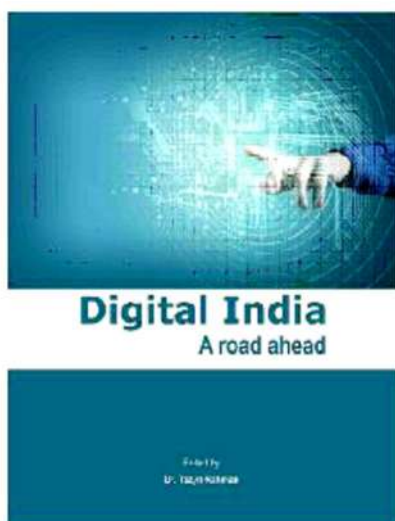
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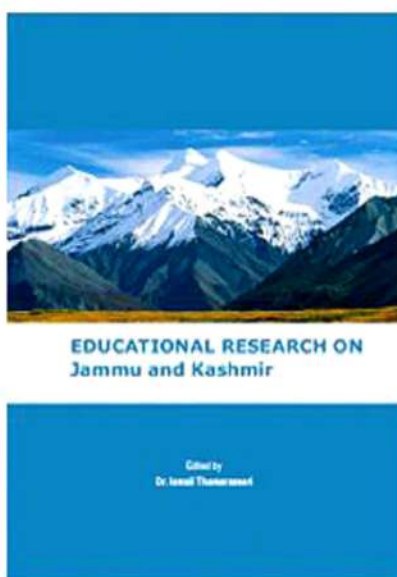
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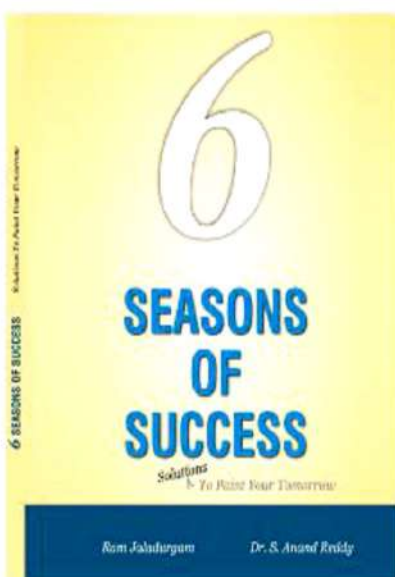
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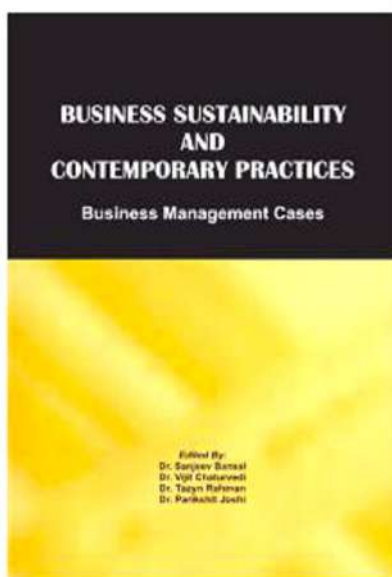
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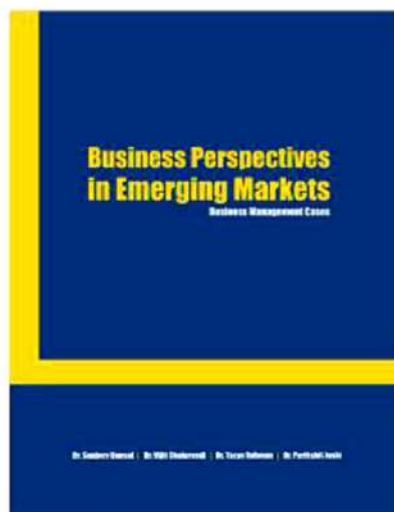
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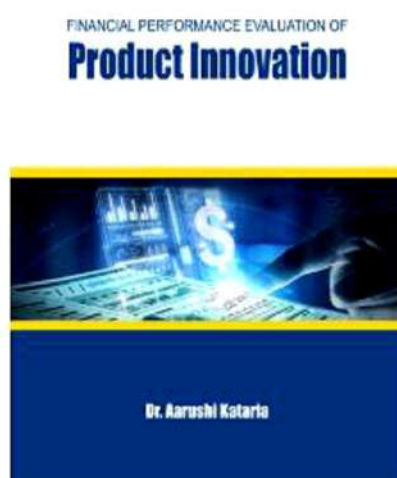
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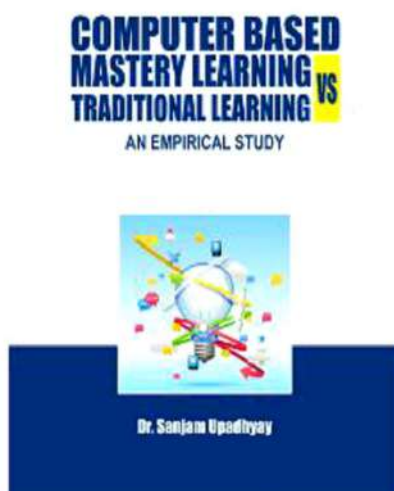
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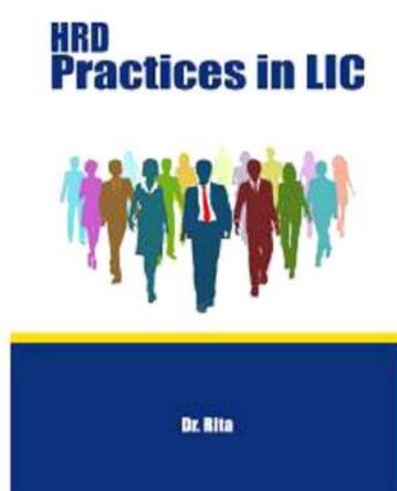
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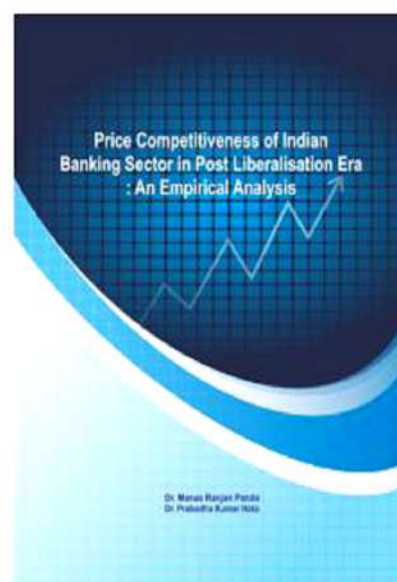
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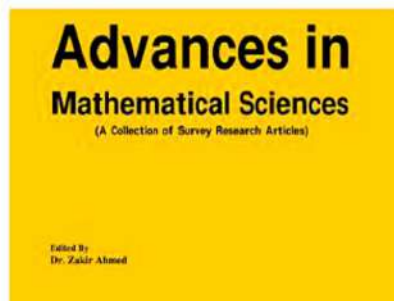
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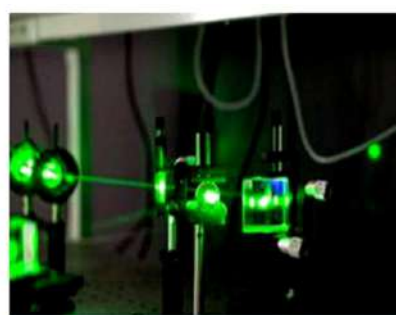


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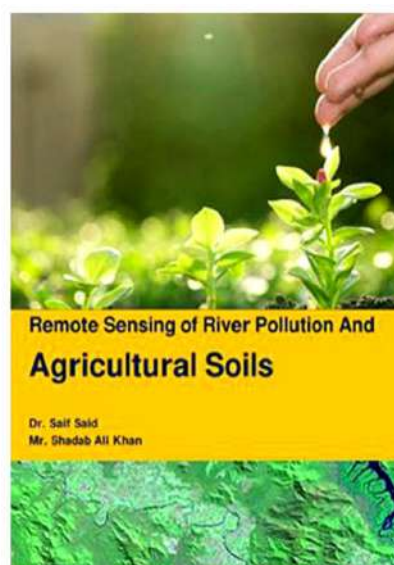
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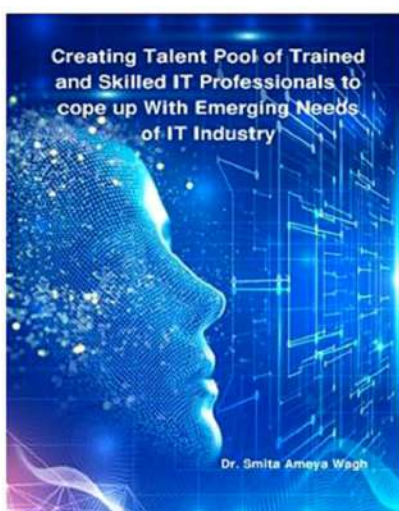
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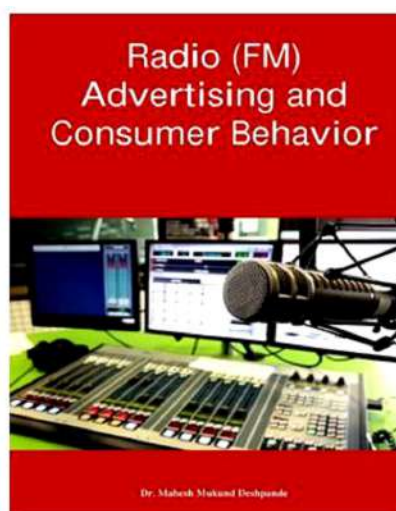
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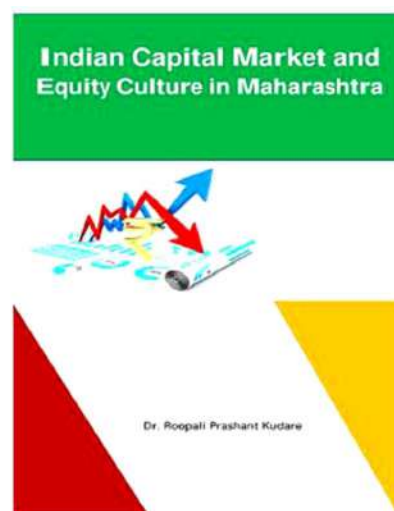
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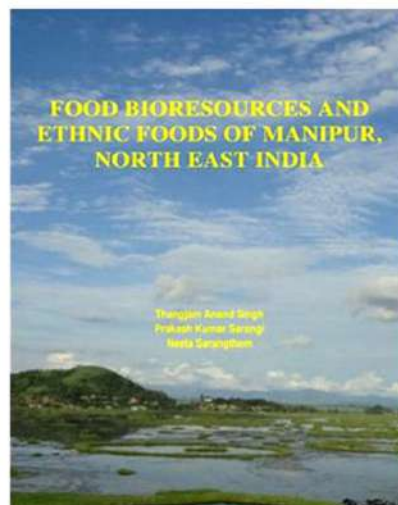
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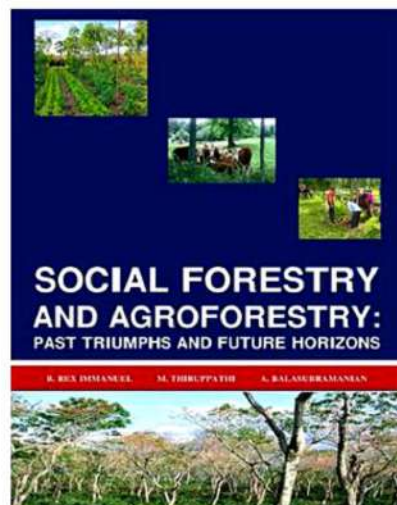




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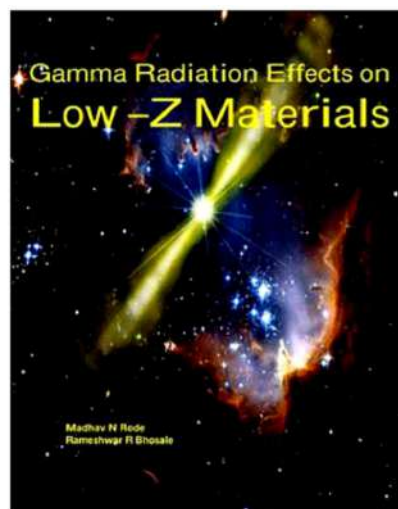
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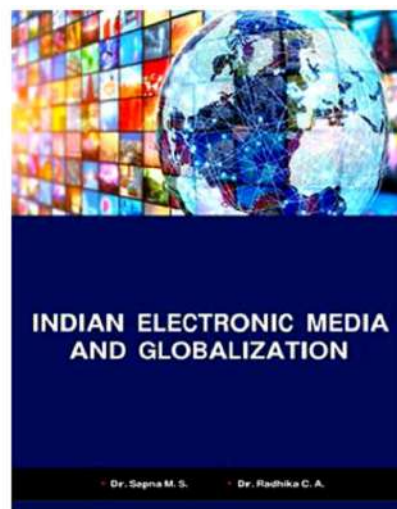
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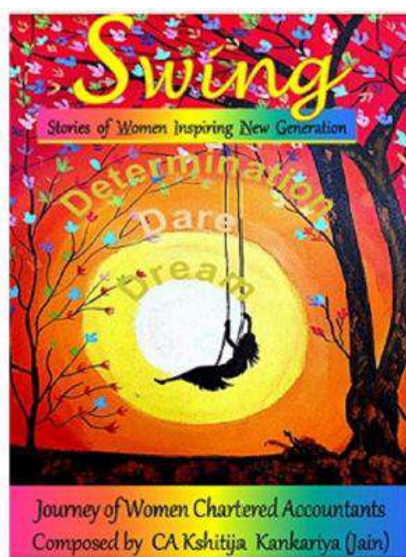
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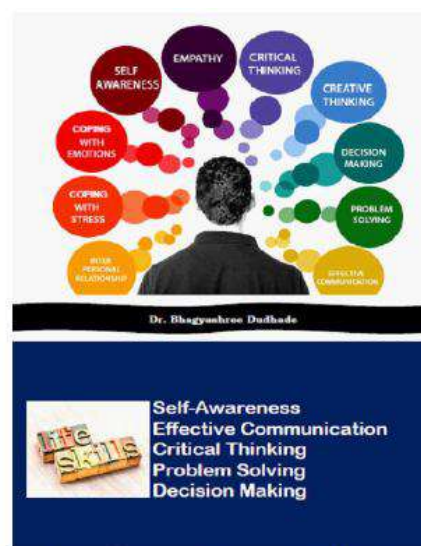
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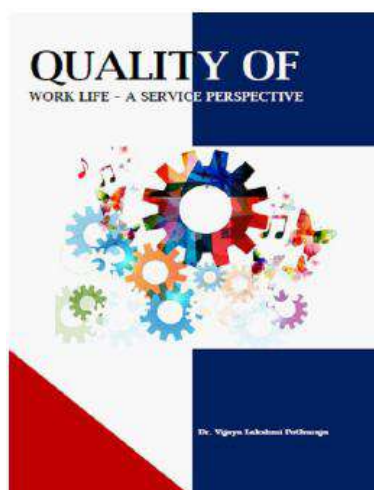


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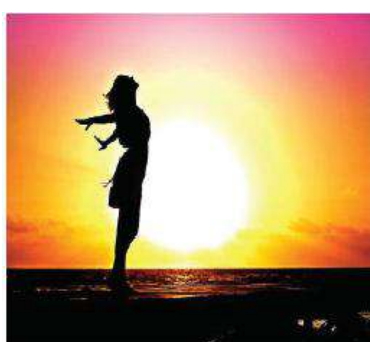
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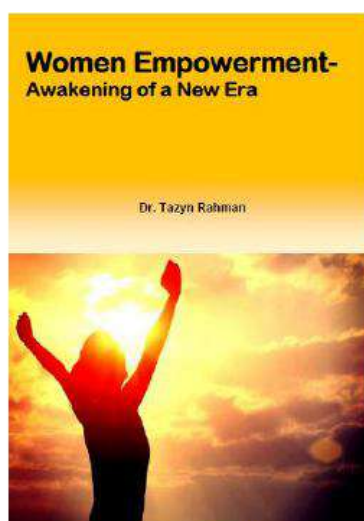
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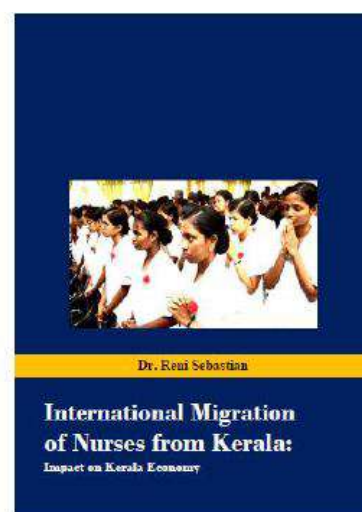
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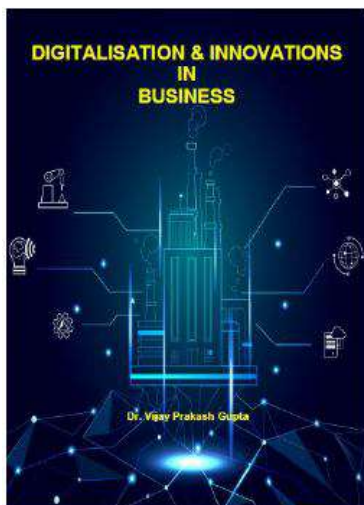


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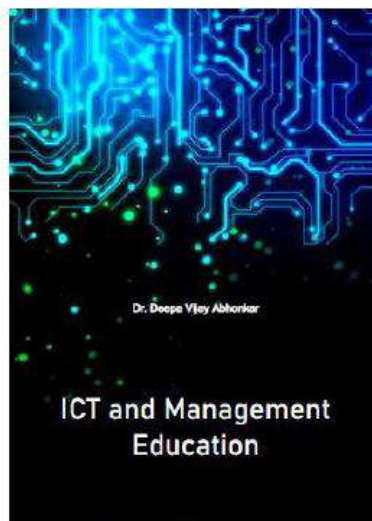
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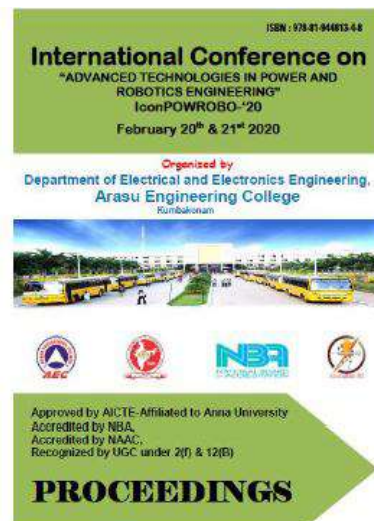




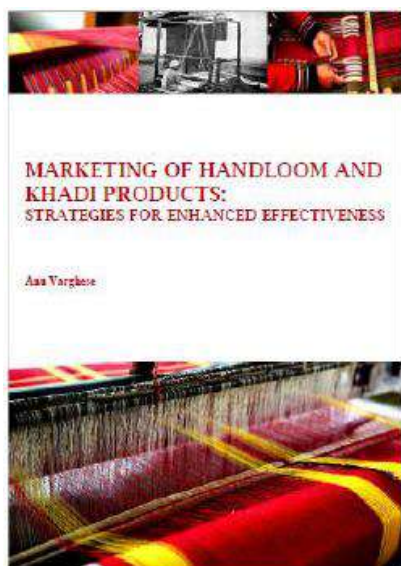
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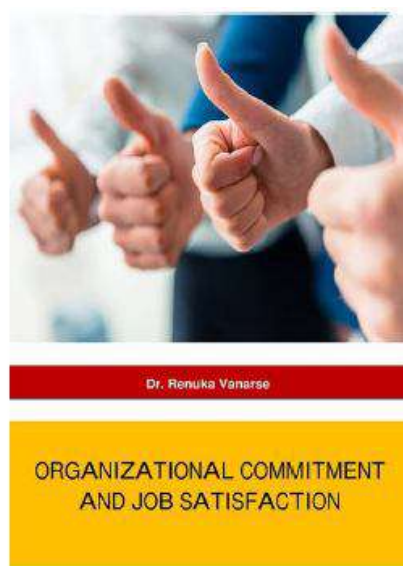
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