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Quest - 2019

6th National Conference

on

“Industry 4.0”

Organized by

Faculty of Management

Navsahyadri Group of Institutes

Pune

in association with

Savitribai Phule Pune University

(Under Quality Improvement Programme)

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NAVSAHYADRI
EDUCATION SOCIETY

Navsahyadri Group of Institutes

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Established in year 2009 as NAVSAHYADRI GROUP OF INSTITUTES with a vision and dedication of founder president Hon. P.N. SUKE. The most important goal of NESGI is to give high level of technical and managerial education so as to develop the business and industrial environment. We strive to maintain a balance between amount of benefit for the engines & the future leaders.Through its creative teaching and research department NSE pushes the frontiers of modern science and engineering. By seeing the positive perspective the academicians, educationalists, administrator & enthusiastic people of Pune have initiated the information of a society under the name of NAVSAHYADRI GROUP OF INSTITUTES in 2009 at Naigaon Pune.

ABOUT IARA

Indian Academicians and Researchers Association (IARA) is an educational and scientific research organization of Academicians, Research Scholars and practitioners responsible for sharing information about research activities, projects, conferences to its members. IARA offers an excellent opportunity for networking with other members and exchange knowledge. It also takes immense pride in its services offerings to undergraduate and graduate students. Students are provided opportunities to develop and clarify their research interests and skills as part of their preparation to become faculty members and researcher. Visit our website www.iaraedu.com for more details.

ABOUT CONFERENCE

Industry 4.0 is a name given to the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things, cloud computing and cognitive computing. Industry 4.0 is commonly referred to as the fourth industrial revolution.

First Industrial Revolution is Industry 1.0. that started in 1760s and lasted into 1830s, the production evolved from physical strength to machine power. Increasing in quantity and improving in quality, the machines used steam power.

There were three industrial revolutions took place that transformed our modern society. With each of these three advancements—the steam engine, the age of science and mass production, and the rise of digital technology—the world around us fundamentally changed. And right now, it's happening again, for a fourth time.

The fourth industrial revolution takes the automation of manufacturing processes to a new level by introducing customized and flexible mass production technologies.

This means that machines will operate independently, or cooperate with humans in creating a customer-oriented production field that constantly works on maintaining itself. The machine rather becomes an independent entity that is able to collect data, analyze it, and advise upon it.

This becomes possible by introducing self-optimization, self-cognition, and self-customization into the industry. The manufacturers will be able to communicate with computers rather than operate them.

This conference aims to provide a platform for researchers to expand the knowledge base about various trends, methods and technologies in industry and management.

During this event, there will be discussions on how to increase control, safety and security by integrating system smartly. We also will investigate how artificial intelligence and data analysis will improve decisions of outsourcing, operation efficiency and networking.

The conference also examines how Industry 4.0 will improve its resource planning (ERP), estimation, market place and analysis.

The conference will also discuss on how digital system is enabling workers to communicate, share experience and develop skills.

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ELECTRIC VEHICLES IN INDIA – A WAY FORWARD-CHALLENGES & OPPORTUNITIES

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ABSTRACT
The unprecedented growth in the number of vehicles is contributing significantly to Environmental Degradation & Climate Change. Indian Government is seeking solutions to address these issues by encouraging use of alternative fuels and battery operated electric vehicles besides setting up of stringent emission norms for automobiles. For Internal Combustion Vehicles (ICVs), BS VI emission norms are now slated to become mandatory from April 2020.

The Electric Vehicles (EV's) are now gaining the attention across India and Indian Government policies are now aimed at boosting penetration of EVs. Notwithstanding this, there are challenges which need to be addressed for the EV industry to flourish. The requirement of the vehicle buyer with respect to key factors such as Range in Km per Charge, the Charging Infrastructure, the Speed, the Comparable higher Costs of an EV and the life of the batteries are holding the potential EV buyer to opt for an EV instead of ICVs. The technological development two components namely EV Batteries and EV Charging Infrastructure is expected to lead to larger penetration of EVs which in turn would lead to higher production volumes of EVs, bringing the cost reductions for EVs. The Opportunities lies in the technological development of these factors which will not only address India's concern with huge imports of crude oil and balance of payments but also address the Environmental and Climate Change issues.

The role of Technology Driven Supply Chain in addressing these challenges is Critical. While the technological development of EVbattery is critical to address Range, Speed and Life issues, the technological development of EV chargers for fast and quick charging is critical to address the Charging Infrastructure issues. The paper discusses these Challenges and Opportunities, highlights the role of Technology Driven Supply Chain &attempt to project future scenario for EVs in India.

Keywords : Crude Oil Imports, Environment , Electric Vehicles, EV Battery& Charging Infrastructure , Technology Driven Supply Chain , Penetration of EVs

1. INTRODUCTION

The Indian auto industry is one of the largest in the world. The Table below depicts the Automobile sales trends in India over the last five years[1].

Table-1: Automobile Domestic Sales Trends in India (In Lakhs)

Category of Vehicles	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Passenger	26.65	25.03	26.01	27.89	30.47	32.87
Commercial	7.93	6.32	6.14	6.85	7.14	8.56
Three Wheelers	5.38	4.80	5.32	5.38	5.11	6.35
Two Wheelers	137.97	148.06	159.75	164.55	175.89	201.92
Grand Total	**177.93**	**184.23**	**197.24**	**204.68**	**218.62**	**249.72**

Source:http://www.siamindia.com

The growth story is not limited to last five years but has been the case ever since the 90's when India embarked upon the privatisation, liberalisation and globalisation path, breaking the shackles of protectionism and licences raj.The total registered vehicular population which stood at 213 Lakhs in year 1991 has now reached to whopping more than 2300 Lakhs. No wonder India currently imports 219.15 MT of Crude oil for USD 87.725 billion (INR 5.65 lakh crore).

The need for mobility is very large in India. Easier finance options, newer and more fuel-efficient models and rising incomes are helping the demand for vehicles. The massive government spending in rural programmes and large infrastructure projects is leading to a pick-up in volumes in smaller towns and villages.[2] In metros and in second order cities, the sales are also being aided by the lack of public transport and the convenience personalised transport provide for point to point travel. These growth trends would unquestionably continue to grow in coming years.

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As far as share of types of vehicles in the total registered vehicles is concerned, the share of 2 wheelers is dominant. Theshare of two wheelers in total registered motor vehicles in India as of 2016 stands at 73.5 % , followed by the combined share of cars, jeeps and taxis at 13.1 % , Buses at meagre ~ 0.9 % , Goods vehicles at 4.6 % with remaining 8.1 % accounted by other vehicles namely tractors, trailers, three wheelers (passenger)/Light Motor Vehicles (LMVs) and other miscellaneous vehicles[3].

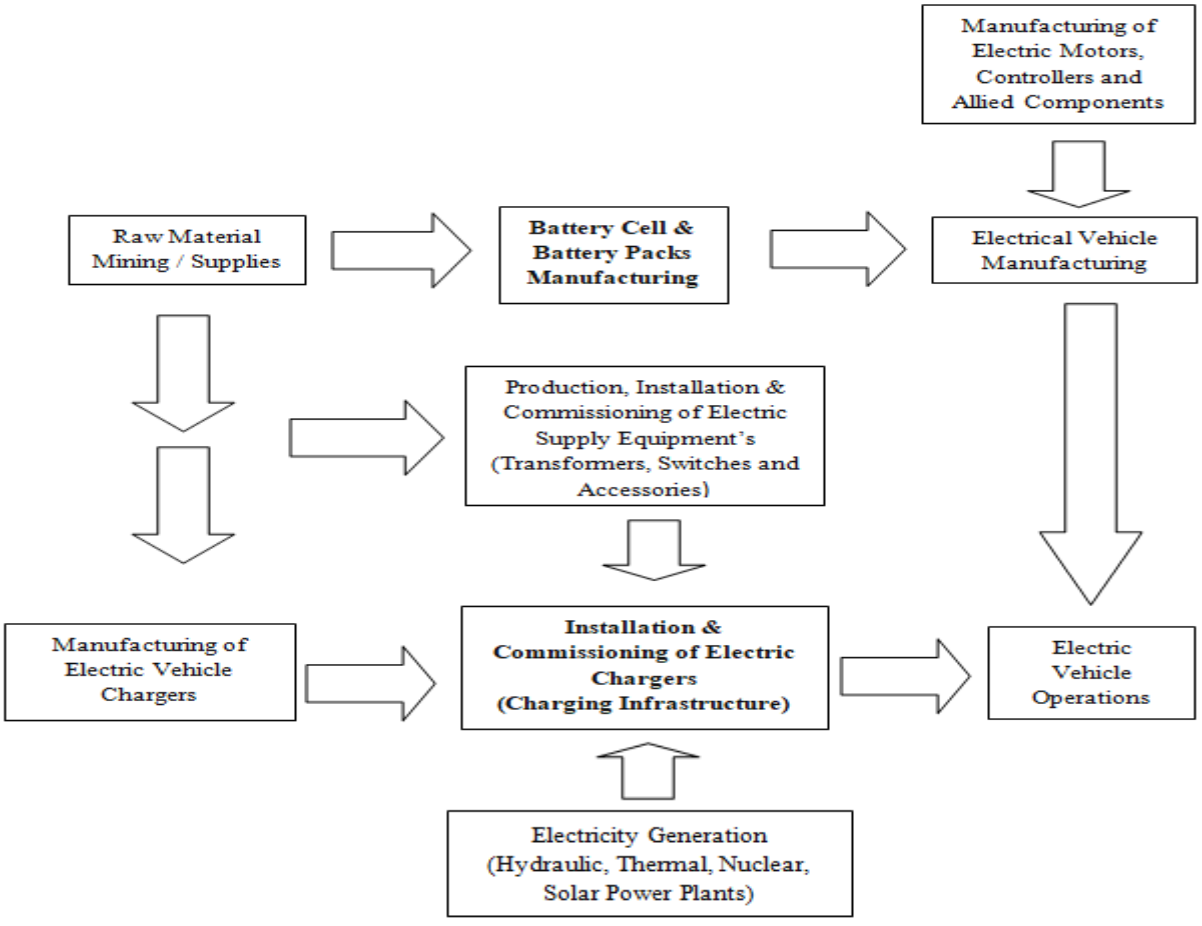
The unprecedented growth in the number of vehicles is raising certain serious issues about India's balance of payments and environmental degradation. Indian Government is seeking solutions in this regard by encouraging use of alternative fuels and battery operated electric vehicles and setting up of stringent emission norms for automobiles. BS VI norms are now slated to become mandatory for Internal Combustion engines from April 2020.

Current share of Electric Vehicles in total Vehicles in India is at less than 1 per cent[4]. This share is bound to increase with the encouraging policies of Government of India and State Governments. When compared with Conventional IC Engine Vehicles, Electrical Vehicles are primarily facing challenges with respect to two key critical factors. These two critical factors are EV Batteries and EV Charging Infrastructure. These challenges are also opening up Opportunities which will address these challenges to help larger and deeper penetration of EVs in India. The opportunity mainly lies in the sustainable technological development of supply chain for electrical vehicles particularly with respect to electrical vehicle batteries and electrical vehicle charging infrastructure as discussed below.

2. SUPPLY CHAIN FOR ELECTRICAL VEHICLES – CHALLENGES & OPPORTUNITIES

The typical supply chain for Electric Vehicles manufacturing and its operations is depicted in figure-1. The main challenges for making the above supply chain sustainable lies in Technology Development of two Critical factors in above supply Chain. These two Critical factors are EV Batteries and EV Charging Infrastructure. Development of Batteries is critical to address the key issues relating to Range in Km per Charge, the Speed, the charging duration, comparable higher capital costs of an EV and the life of the batteries. On the other hand development of the robust battery charging infrastructure backed up with robust information systems across homes , housing colonies , city roads, parking centers, malls , schools and colleges , offices , inter -city roads, State & National highways is critical for removing the range anxiety and charging duration issues .

Figure-1: supply chain for Electric Vehicles manufacturing and its operations



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The technological development of these two critical factors is expected to lead to larger penetration of EVs which in turn would lead to higher production volumes of EVs, bringing the cost reductions for EVs. The Opportunities lies in the technological development of these factors which will not only address India's concern with huge imports of crude oil and balance of payments but also address the Environmental and Climate Change issues.

3. WAY FORWARD

a) Way Forward for EV Batteries

The types of EV batteries currently being considered by Industry are predominantly Lithium Ion based Batteries. The most prominent technologies are Lithium ion–Phosphate (LFP), Lithium- Nickel- Cobalt – Aluminum (NCA), Lithium-Nickel- Manganese Cobalt (NMC), Lithium-Manganese-Spinal (LMO) and Lithium Titanate (LTO) Batteries.The six key parameters[5] around which the Technology Development of Batteries will evolve are **Safety**, **Life** (Number of Cycles & Age) , **Performance** (Peak Power , State of Charge {SOC} and Thermal Management), **Specific Energy**(Energy Stored per kg of weight), **Specific Power** (the power battery delivers per kg of mass) and **Cost**. Among all the six key parameters, the most critical parameter which would require elaborate attention with regard to range per charge is the Specific Energy. This factor limits the driving range of Electric Vehicle. This opens the significant opportunity for development of batteries with higher specific energy duly taking into consideration its trade off with remaining five parameters. This tradeoff is elaborated below.

NCA, NMC and LMO offer higher Specific Energy but are less safe than LFP and LTO and require more specific efficient cooling systems, SOC monitoring and cell discharge balancing. With respect to Specific Power, all battery technologies mentioned above perform equally except NCA, whose performance is still better among remaining four battery technologies. As regards, the Cost aspects while LFP, LMO and NMC are cheaper, the chemistries such as NCA and LTO are costlier. Although NCA, LTO and LFP are expected to have higher life span then NMC and LMO, it is yet not clear as to how fast these battery types will age across a range of temperature conditions.[6]

Currently the Lithium-ion Phosphate (LFP) batteries are predominantly used by Electric Vehicle Manufactures considering its advantages with respect to Safety, Life Span, Performance and Specific Power. However, considering the Specific Energy & Range issues, the remaining battery technologies, particularly NCA and NMC are expected to develop further as we move forward.

b) Way Forward for EV Charging Infrastructure:

A robust charging infrastructure is the key in encouraging the adoption of electric vehicles. In general, there is broad agreement that public charging infrastructure is important to the growth of the electric vehicle market, among other factors related to electrical vehicle cost and awareness[7]. Besides the electric vehicle, the availability of user friendly charging infrastructure is of utmost importance to make the supply chain for EV operation sustainable.

The types of charging are Level 1 charging, Level 2 charging and DC fast Charging. Level 1 Charging uses the same power supply and standard outlets available in the households using power cord and equipment that two wheelers and cars come with. This is a simple charging facility which can be made available in the household or business property parking by installing a dedicated electric outlet in the parking lot of the premises. The cost of installation for Level 1 Charging is low and has low impact on the grid. The disadvantage is that it provides slow charging. This kind of Charging is typically suitable for private 2 wheelers and cars for night charging (6-8 Hours charging).

Level 2 Charging requires installation of an Electric Vehicle Supply Equipment to enable faster charging. It is more efficient than Level 1 Charging and may provide charge of 80 kms within 2-3 hours. Level 2 charging have a higher impact on peak power than Level 1 Charging. This could be one of the best options for public charging infrastructure at Parking Spaces, Malls, Office Parking lots and Schools& Colleges.

DC Fast charging provides compatible vehicles with an 80 per cent charge in 20-30 minutes by converting high voltage AC power to DC power for direct storage in EV batteries. This provides a charge of 90 to 130 Km in 20 minutes. It is significantly more expensive than Level 1 or Level 2 equipment and will require a high voltage 3 phase power connection. It has higher impact on peak power than Level 2 Charging.

When it comes to Public EV charging facilities, the relevant benchmarks could be the Level 2 and DC fast charging, with Level 2 charging stations being established at Parking Spaces , Malls, Office Parking lots and Schools & Colleges and DC Fast Charging being established at dedicated battery charging stations besides city ,

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town and village roads, state highways , major district roads and national highways[7] on the lines of petrol & diesel dispensing stations.

The establishment of electrical vehicle charging infrastructure on the above lines is the Way Forward for making the EV penetration in India larger and deeper.

4. CONCLUSION

With the burgeoning vehicular population, it is critical and imperative for India to seek alternative propulsion means to curtail the import of crude oil and address the environmental degradation and climate change. The battery operated electrical vehicles offer solutions to address these two issues. There are challenges though.These challenges open up opportunities. These opportunities mainly lie in the Sustainable Technological Development of Electrical Vehicle Batteries and Electrical Vehicle Charging Infrastructure.

Currently the development of battery technologies such as Lithium-ion Phosphate (LFP), Lithium- Nickel-Cobalt –Aluminum (NCA), Lithium-Nickel- Manganese Cobalt (NMC) appears to be the Way Forward. The establishment of robust and penetrative infrastructure for Electric Vehicle Charging stations will also be key factor in making the technology driven supply chain for Electric Vehicles sustainable and a Way Forward.

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PORTFOLIO MANAGEMENT AND MUTUAL FUND

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ABSTRACT
If any investor want's to investment in new fund then he or she have to make portfolio management. Mutual funds are investment medium to investors who have mutual objective i.e. Investment and earn money from the same and that investors comes together and invest dear money into Mutual Fund of the investment company. All the intermediaries are provide service to the investors and give the suggestion to the investors. Those intermediaries called as Asset Management and portfolio management companies. Mutual Funds invest in the shares and equity that is way it is called mutual funds. When the amount is invested in debentures it is called as debt fund and investment in bonds debentures is a debt fund.

Keyword: Mutual fund, Portfolio Management, Investment, Inventor, Funds and Saving

INTRODUCTION
A mutual fund is a set of money stored by many investors, which means saving money and making money through their investment. The money generated in this way is invested in various asset classes. Debt funds, liquid assets and such. Just like the benefits and prizes received during the investment period, all the investors have participated in equal proportion in equal proportion, as is their contribution in debt.

Mutual funds are registered with SEBI (Securities and Exchange Board of India), who regulate security markets before collecting funds from investors. Investing in Mutual Funds It is easy to buy or sell stock or bonds online. Moreover, investors can sell their shares when required by the investor or when required.

TYPES OF MUTUAL FUNDS IN INDIA
There is a wide range of mutual funds in India that have been classified based on investment objectives, asset class and structure.

A. Types of mutual funds based on asset classes

1. Equity Funds
These funds are invested in equity stocks or shares of companies. They give higher results, so they are considered high-risk funds.

2. Debt funding
These funds are invested in debt like government bonds, company debentures and fixed income assets. They are known as secure investment tools as they offer fixed returns.

3. Money Market Fund
These funds are invested in liquid instruments such as CP, T-Bills, etc. They are considered as a safe investment option, because you still get a temporary return on your investment. This is a perfect option for investing in their investments.

4. Hybrid or balanced fund
These types of funds are invested in different asset classes. There are many times when the loan value is less than equity; it could well be another way around. In this way, returns (and) and risk (s) give a complete balance strike.

5. Sector Funds
In these funds, it is invested in a particular area or in the market segment. For example, fundamental funding prevents investors from investing in infrastructure instruments offered by infrastructure companies or infrastructure companies. Returns to an investment which is directly related to the performance of that particular area. Risk factors with these schemes vary in the field sector.

6. Index funds
These funds are an investment tool that shows a specific index on the index to monitor the return and index movements eg Shares of BSE Sensex

7. Tax-saving savings
These funds invest large amounts in equity shares. Tax-saving funds make an investor eligible for tax deduction under the Income Tax Act. The risk factors involved in these funds are usually at the top. At the same time, higher returns are offered if the performance of the funds is matched.

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8. Funds of Funds
These funds invest in other mutual funds and the refund targets depend on the overall performance of the fund.

B. Types of mutual funds based on structure
1. Open Ended Fund
These mutual funds invest in investment instruments for purchase or redeemed units throughout the year. Net Asset Value (NAV) is made of such purchases or redemptions continuously. These funds offer liquidity to investors, so they are preferred by the investors.

2. Close-ended Fund
These mutual funds deal with investment instruments units which can be purchased during the initial period. The units are eligible for the amount from the date of the specified maturity. To provide liquidity, these plans are listed on the stock exchange for trading purposes.

C. Types of mutual funds based on investment objective
1. Growth Funds
These plans invest heavily in investor's equity shares. The purpose of this is to provide capital appreciation. Although these funds are considered risky, they are considered suitable for long-term investment for investors.

2. Income fund
These plans give you large amounts of money on your money such as debentures, bonds etc. They offer services for the purpose of providing regular income and capital protection to the investors.

3. Liquid funds
The money invested in liquid funds invests in short-term and sometimes short-term investment instruments such as CPs, T-Bills, etc. with the sole purpose of providing liquidity. These plans are less than risk factors, and they offer a moderate return on investment. This scheme is ideal for investors with a short-term investment.

D. Mutual fund investment goals
There are various types of mutual funds with a specific set of targets. Mutual Fund Investing Objectives The purpose of the mutual fund's investment is to determine the goals of the fund manager, in which a decisive decision is taken - which should be included in the bonds and funds funded portfolio.

For example, Mr. Pawar intends to invest in the equity market to meet his investment goals that means long-term capital appreciation for children's foreign education, long-term economic goals and their retirement.

According to the investment objective, mostly the mutual funds are classified into 5 categories. The following categories:

1. **Aggressive increase funding**
   Aggressive growth is more likely to increase suddenly and their value increases at a faster pace. Investors invest in aggressive growth funds to get higher returns. Due to the sudden increase of funds, the risk factors involved are extremely high. The reason for this is that suddenly the prices of sudden pricing reduce their value at the time of occurrence in the economy. Investors who are invested in these funds are willing to invest their money for a period of five years and their investment goals are long-term perspective. Investments that have the potential to reduce the value of their investments and are not intended to protect their capital from aggressive growth.

2. **Growth funds**
   Investment in aggressive growth results in higher return on investment. There will be a mix of small, medium and large corporations in investment portfolios. This will include the fund portfolio to invest in a well established and stable corporation. In addition, fund manager will invest a small part of the fund in a newly set small-scale company. Fund manager will choose a growth stock, which will use growth to profit rather than paying dividends. Holding on incremental funds is often beneficial for the investor.

3. **Balanced Funds**
   It is a composite of income and incremental funding, which is known as balanced fund. This fund is a mixture of goals to carry. The goal is to make available current returns to the investors and at the same time there is a possibility of growth. It is the funding to fulfill the various objectives waiting for the investors. Balanced fund 'stability is limited to low to medium but its growth and current income potential is moderate.

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4. **Income fund**
   Funds that generally invest in a range of securitization securities are called income funds. These funds ensure regular income for the investor (s). These funds are ideal for investment, which has retired, because they will be given regular dividends. The fund manager will invest in the company's fixed deposits; Debentures etc. And it will give the investors regular income. This is a stable investment option, yet it has a moderate risk factor. Due to the fluctuations in interest, bond prices will be affected accordingly. Also, the inflation rate is toll on income funds.

5. **Money market mutual fund**
   These funds try to capitalize the capital. Investors in this fund should be extremely careful. There is no interest in the money market mutual fund, despite the ability to pay higher interest rates than interest rates and there is no profit. Also, there is very little that includes risk factors. Because of excessive liquidity, investors can change their investment strategy and change them.

HOW TO INVEST IN MUTUAL FUNDS

If you invest in only one and a mutual fund investing investment, the risk factor will be higher by default. If you invest your capital into investing in a different mutual fund investment, then you will end up stabilizing the risk involved. If a fund does not offer good returns, then you will be protected by other investment instruments.

- **Start your financial needs**
  The need for investment varies among different individuals, because investment objectives vary from person to person. Factors such as financial objectives, risk thresholds, time durations and capital influence the investment decision. Even before you choose a mutual fund investment reading, analyze your financial goals and set your time frame and risk range accordingly. Depending on that, reduce the investment options of their synchronized investments.

- **Benefits of Mutual Funds**
  As an investor, you have a lot of mutual fund instruments. Choosing an investment instrument is a very important task that gives you the benefit of every mutual fund vehicle as an option. There is good reason to expand the umbrella of a mutual fund vehicle to take advantage of the benefits offered by mutual funds. Apart from the flexibility to plan for investment based on the target of individual investment, mutual funds are beneficial in terms of commercial management, diversification and efficiency.

HOW BENEFICIAL IS INVESTING IN A MUTUAL FUND?

Investors' basic expectations of investing in mutual funds are to maximize returns on their investment. As an investor you can also expect this. At times, you do not have enough time to research and completely control the stock market. For a long time, there is a pre-requisite for trading in stock business, knowledge of stock market and a lot of courage. Opportunity does not knock on your door; you must bear them using your both hands.

Increasing the chances of receiving maximum returns to enable you to take risks increases. It is impossible that every opportunity you make is beneficial for you. Sometimes you are lucky, sometimes you do not do that. If you do not do this, analyze what happens to the wrong and learn from your mistakes. Before purchasing, use a mutual fund calculator to get relevant quotes like your investment, return, risk etc.

The following benefits of mutual funds

1. **Professional Management**
   Mutual funds professionals manage with their hard earned money and experience. They have a suitable research team that helps them by analyzing the performance and feasibility of various corporations. In addition, they found suitable investment offers for their clients. Fund managers manage their finances in such a way that they give high returns on investment. Commercial management is a continuous process and it takes longer to add value to your investment.

2. **Diversification**
   Diversification creates an intelligent investment in your investment. Various mutual funds reduce risk by investing your money in investment vehicles. Obviously, the chances that all the shares will fall at the same time are very less. Sector funds let your investment spread to a single industry, so that there will be less diversification.

3. **More choice**
   The biggest benefit of investing in mutual funds is that they offer broad range of plans that match their long-term expectations. When a new stage starts in our life, it is necessary to discuss with your financial advisors and work on your portfolio according to your current situation.

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4. **Affordability**
   Sometimes, your investment goal or your capitalization does not allow you to invest in large company shares. Generally, the purchase and sale of mutual fund securities is done on a large scale, so investors get less business curriculum benefits. Thanks to the minimum fund requirement, even small investors can give a shot to the mutual funds.

5. **Tax deduction**
   You get tax benefits if you invest for a year or more in capital gains. You can become eligible for tax deduction under the investment of a mutual fund.

6. **Liquidity**
   Open-end funds enable you to redeem a total or partial investment if you want and you can get the current value for your shares. Funds offer more liquidity than most investments in shares, bonds and deposits. It follows the certified process and makes the process efficient and easy to operate. So, get your money as soon as possible.

7. **The average rupee value**
   Regardless of the investment cost of the investment, we make an investment of a particular rupee according to the frequent intervals at an average price of Rs. As a result, you are able to purchase more units after the price decreases; Lower units if prices are high. The average price of the rupee enables us to maintain your investment discipline through continuous investment. This prevents you from unwanted investment.

8. **Ensure transparency**
   Various reputable publications and rating agencies review the performance of mutual funds, so that investors can compare one fund to another. This is beneficial to you as a shareholder because it provides you with the latest updates, which include funding of funds, managers' policies etc. Is included.

9. **Rule**
   According to the Securities and Exchange Board of India (SEBI) regulations, all mutual fund companies are required to register with SEBI because they are complying with strict rules that are designed to protect investors. Total trade transactions are routinely monitored by SEBI.

EQUITY INVESTMENT APPROACH

Investing in equity is not a rocket science. You must follow the investment you need. It runs through the area and various equity funds.

1. **Bottom-up Approach**
   When your objective is better than a domain, your goal to invest in the best corporation is ideal. When fund managers are sure of the capabilities of corporates and their potential, they give you green signal. Generally, there are top 5-10 companies in total portfolio of portfolio assets. Individual stock exposure and diversified funds are recommended to monitor sector exposure so that exposure will not lead to a particular stock or sector.

2. **Basic Investor Approach**
   Fundamentals of investment decision-making, investment of basic materials or research cements. Research does not just revolve around financial figures; they went up and down on published literature or reports. With research analysts, fund managers get a good perspective from their company employees and explore unmanned data which can become a well-planned opportunity over time.

3. **Quality First Approach**
   When you focus on quality, you're on the right track. Many times Fiscal quality is ignored. Later, she was disaster. Change your overall focus on quality, as it will help you avoid harm. The quality first approach lets your funds work well.

4. **Long-Term Investment Approach**
   As an investor, patience works with you and therefore helps you to get rid of market expectations. Analyze the value of the fund and make investment decisions accordingly. It does not leave room for negative decisions. Long-term investors use unwanted times for their benefit because soon after or later the stock market will know the probability of money and the stock will return.

5. **Intelligent and systematic approach**
   This investment approach emphasizes emerging themes and does not pay much attention to the so-called tips and tricks.

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6. **What is a trending approach**
   See what's going on, because it will be prolonged. It is very important to understand the current financial situation and potential financial potential, so that in the future, you can make the best investment decisions in the changing times.

DEBT INVESTING

The best approach to investing in debt is focusing on getting a consistent return and at the same time, to keep away from the risk hazards. This is a definite way to get a refund in the form of fixed income. When investing in a loan, keep the following things in mind:

1. **First Security**
   Do not be carried away and importance to safety. Do not be shy when it comes to withdrawing short-term benefits and stay firm about your decisions.
2. **Risk Management**
   Carefully analyze the rating, value, integrity, efficiency, efficiency, management, finance, etc. of the company; Help reduce the risk factor. Lower risk is better for your investment.
3. **Interest Rate Risk Management**
   Focus on managing interest rates with the help of portfolio at the intermediate level and avoid the rate of interest rates of market rates.
4. **Careful balance supervision**
   Work to maintain prudent balance in corporate bonds and government securities. In addition, do not forget to diversify the limitations on single corporation exposure.
5. **Depending on the research**
   Take advantage of strong equity research to identify powerful entrepreneurial companies and explore the explored domains. It will disclose the best mutual fund scheme for you.
6. **Liquidity rules**
   Follow strict liquidity rules to ensure that your portfolio can be fluid when you want to pay back.

WHAT IS ELSS?

ELSS is known as Equity Linked Savings Scheme. This is a type of diversified equity mutual fund scheme. By investing in ELSS mutual funds, we get double benefits of tax deductions and capital appreciation. Section 80C of Income Tax Act makes you eligible for tax exemption. By default, there is a three-year lock-in period in the Equity Linked Savings Scheme.

WHY SHOULD YOU INVEST IN ELSS?

When investing in an equity linked savings scheme, when it is effectively planned, it helps you save money. Generally, a tax savings investment vehicle comes with a lock-in period of 3 to 15 years. ELSS comes with a lock-in period of at least three years. Compared to other tax saving devices, the three-year period is reduced. The icing on the cake means that the capital gain of the ELSS fund is tax-free. No tax is levied on the amount of interest, basic amount or maturity.

When it comes to withdrawals it is also free because the holding period is more than 12 months. This means that there is no tax on capital gains. Depending on your preference, you can choose from the following schemes:

- Growth Plan
- Dividend Plan
- Dividend reinvestment Plan

The development plan is an investment plan that can grow until your investment grows. If your fund's Net Asset Value (NAV) has increased, the dividend scheme will give you money back to your fund. Last but Not least; the dividend redistribution plan allows your dividend payout to be invested in some additional components of the plan.

HOW TO CHOOSE A FUND?

Mutual fund equipment’s are available to you. But, before mutation of the mutual funds' ocean, it will be nice if you combine your bonds, stocks and money market funds according to your choice. Experts have recommended that this investor can take any good investment decision. Do not forget to compare mutual funds before buying. As an investor, following the following strategies for making your investment strategy should be remembered:

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1. The key to diversification
It is good to deal with your investments in various types of stocks, money market securities and bonds in mutual funds. Every musical instrument brings good and bad things to the party. Diversification is ideal for the same domain of securities. It's been beneficial for a long time. If one area is not good, then diversification will give your funds the best results.

2. Keep inflation in mind
The amount you invest today will be used later. Over time, inflation flows through its wings and it starts rising. So, we have to think about the subsequent effects. Money Market funds have gained popularity as their value, but the returns can be very low.

3. Patience please
The price of shares decreases and unexpectedly increases. What can be happening today is tomorrow, so prepare mentally to handle the ups and downs. If you do not need money right now, do not panic if your fund's value decreases. Part of the sweet-bitter reality of the stock market is the rise and fall. If a fund is underlined then it can do very well. So be patient and get your money back.

4. Take your age into consideration
Small investors have invested a lot of time in stock funds. Why? This is because they have a lot of time for them. Their investment in stock funds gives them long-term returns. On the other hand, those who expect to retire are eager to protect their money from any drop in prices. To maintain value, it is ideal for investing in money market funds or bonds for that age group.

5. Determine the age appropriate investment mix
Decrease your age by 100, remaining / answer can be a good option for investing. Investing in a mutual fund stock will help in determining the contribution of your total funds.

6. RISK Threshold
When choosing a mutual fund, make sure that you remember how much your risk is. Do not go out of your comfort zone. Another thing to remember is retirement, yes you are after retirement. If you are on a hurry, then we should be fair to risk factors. To get the maximum mutual fund benefits, it is possible to find aggressive investment strategies that young investors have time in their hands.

CONCLUSION

If the investment is long-term the 70 percentage amount is to be made for invested into equity out of this 40 percentage investment is made into small cap or emergency fund or mid cap and remaining 30 percentages should we invest into 15 percentage in debt and 15 percentage in hybrid mutual funds. While investing for long-term the amount is to be invested into debt because the returns of Debt fund can be 8 to 9 percentage year. If there is some need raised for investor he can sale the debt fund also and when the amount is available for investment investor can invest money

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ORGANISATION STRUCTURE OF POLICE DEPARTMENT IN MAHARASHTRA

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ABSTRACT
The Chief Director General of the State is the best place in all the states of the state. It is also considered an important person in which there are various categories from top to bottom. The state's police activities are according to their authority and category. When we reach from the top to the bottom, their rights decrease. The Inspector General of Police is a special area or range in their area, and therefore they are head of the area. The District Superintendent of the District is the District Chief and his responsibility is to be responsible for that district. Police personnel are working at the lowest level

Keyword: Police, Organisation and District Superintendent of Police

INTRODUCTION

The Chief Director General of Police of the state is the best place in all the states of that state. It is also considered as an important person in whom there are various categories from top to bottom. The policing activities of the state are as per their authority and category. As we move from the top position to the lower position, their rights decrease. The Inspector General of Police is a special region or range in his field, and so he is the head of the field. The Superintendent of Police of the district is the head of the district and its responsibility is considered to be responsible for that district. Police personnel are seen working at the lowest level.

1. Director General of Police (DGP)

In particular, the highest authority of any state in the Police is DGP (Director General of Police). In India, the Director General of Police (DGP) is a three-star rank and is the highest quality police officer in the Indian State and Union Territory. All the DGP officers are Indian Police Service (IPS) officers. DGP is generally the head of state police force in every Indian state. Additional officers in the state also hold the post of DGP. General appointments for such officers include the Directorate of Vigilance and Anti-Corruption Bureau, Prison Inspector General, Fire Brigade and Civil Defense, Crime Investigation Department (CID), Police Housing Society etc. Besides, officers of the Directorate holding the post of DGP, Central Investigation Agency (CBI), DG Central Reserve Police Force (CRPF) etc. are regularly appointed in Central Government institutions. The Police Inspector General or the Additional Director General or Police Commissioner (State) is a national symbol of the sword and baton over.

2. Additional Director General Of Police (ADGP)

The Additional Inspector General of Police (ADG) in India is ranked 3 stars, the highest quality police officer in the Indian state and the region. All ADGs are Indian Police Service (IPS) officers. The equivalent position or title for a state government or federal government is the commissioner of police, special or additional secretary and cabinet secretariat. An icon showing ADG status is the national symbol on sword and baton.

3. Inspector General Of Police/ Special Inspector General Of Police (IGP/SIGP)

The Inspector General of Police or the Inspector General of Police is a senior police officer or a senior police officer of many countries. Rank usually refers to the head of the larger regional command under police service and in most countries, it refers to the senior officers of the entire National Police.

4. Deputy Inspector General Of Police (DIGP)

Police Sub-Inspector (DIG) or Additional Commissioner of Police (IPS) is one-star rank. The officer holding this position is subject to the Senior Superintendent of Police or Police Deputy Commissioner and Police Inspector General or Police Commissioner. It is approximately equal to the security of the commander of the UK Police Service and the Assistant Chief Constable. Aspire Protocol Police rank DIG rank of Lieutenant Colonel and below Army Colonel's rank.

5. Superintendent of Police/Deputy Commissioner Of Police (SP/DCP)

In India, the District Superintendent of Police (SP) or the Deputy Commissioner of Police (DCP) is the district police force. The Superintendent of Police is the officer of the Indian Police Service. They have been entrusted with the responsibility to comply with the law and order and related issues of the state or a Union Territory. They have been assisted by the State Police Service and other state police officers. Their rank badge is more than a star sign, but people selected for a higher category or fifteen or more years of service serve the state

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symbol than two stars. The following posts are Additional Police Deputy Commissioner (ADLDCP) or Additional Superintendent of Police (ASP), the above posts are Superintendent of Police (SSP) or Additional Commissioner (ACP). The post of the Superintendent of Police is equivalent to the rank of lieutenant colonel of the Indian Army.

6. Superintendent of Police/Deputy Commissioner of Police (Junior Management Level)

District Superintendent of Police (SP) or the Deputy Commissioner of Police (DCP) is the district police force. The Superintendent of Police is the officer of the Indian Police Service. They have been entrusted with the responsibility to comply with the law and order and related issues of the state or a Union Territory. They have been assisted by the State Police Service and other state police officers. Their rank badge is more than a star sign, but people selected for a higher category or fifteen or more years of service serve the state symbol than two stars.

7. Additional Superintendent of Police/Deputy Commissioner of Police (ASP/DCP) [Less than 10 years of service]

Additional Superintendent of Police or Additional Deputy Superintendent of Police (Additional SP or ADLCPCP) is still being used in India where the officer holding the post, Indian Police Service or West Bengal Police Service (WBPS), Odisha Police Service (OPS), Maharashtra Police Service (MPS) etc. The above posts are either the Superintendent of Police (SP) or the Police Deputy Commissioner (DCP), and under the posts below, the Deputy Commissioner (Deputy SP / DSP) or ACP (Police Assistant Commissioner)

8. Deputy Superintendent of Police/Assistant Commissioner Of Police (DSP/ACP)

In India, senior Assistant Superintendent / Assistant Commissioner or senior officials of the above posts may have National Indian Police Service or State Police Service, whereas the Indian Inspector and Constable are from the independent Provincial Police Force. The Assistant Commissioner's status was also used by Indian Income Tax, Customs, Central Product and Service Tax Administration as the Revenue Service Officer.

9. Police Inspector (P.I.)

The observer is both a rank and an administrative post, used in both contexts. However, not every police force has an equivalent status. He is the head of that Police station.

10. Assistant Police Inspector (A.P.I.)

The observer is both a rank and an administrative post, used in both contexts. However, not every police force has an equivalent status.

11. Police Sub-Inspector (SI)

Sub-inspector (SI) usually has a shortage of police personnel (head constable, equivalent to corporations, with police outposts). They are the lowest ranking officers whose Indian police can be charged in court according to the rules and regulations, and in general it was the first investigating officer. The officers under him cannot file charge sheets, but they can inspect the cases on their behalf.

12. Assistant Police Sub-Inspector (ASI)

A police sub-inspector (ASI) is one of the main constables in the police force of India, under the sub-inspector. Rank mark for AS is one star and there is a red and blue ribbon on the outer shore of the shoulder belt.

13. Head Constable (HC)

Head Constable of Indian Police is like a sergeant in police forces in other countries. Head constable puts three point-down shavings on their pool or three times on their applets.

14. Police Constable (PC)

Police Constable (Compress PC) is the lowest police rank in India, followed by Head Constable. Since the general law and order is the political subject of India, every State Government recruits the Police Constable. If a police constable has no shoulder signs, the head constable has a bar or a chevron state. All senior officials are the Indian Police Service Officers appointed by the Civil Services Examination. Since each state has its own police force, the uniforms and uniforms of the police are different, however, the structure has a uniform design. Central paramilitary forces also reserve the same state of state under the Central Executive, even if their jurisdiction is very different. All the Police Constable Wear (Khaki) colored uniforms which shows that he / she is a police officer. Police constables in India have been under the custody of the gun, but the ability to use them is considered to be the authorization passed by the order of the police command.

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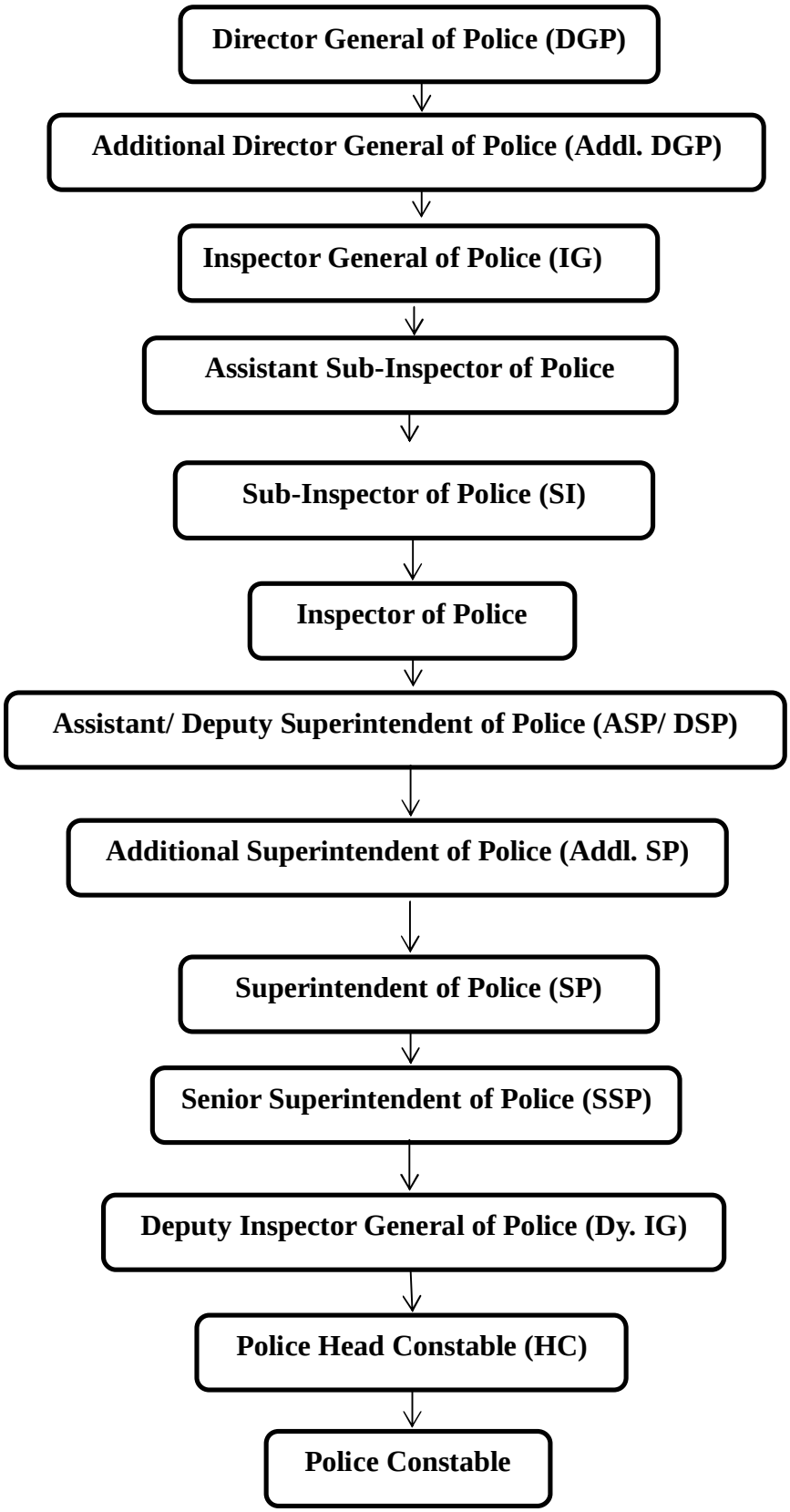
ORGANIZATIONAL STRUCTURE OF POLICE DEPARTMENT

Organizational Structure Each states of India has a police force. The superintendence over it is exercised by each State Government. The head of the police force in the State is known as Director General of Police (DGP). The DGP is responsible to the State Government for the administration of the police force in the State and for advising the government on the police matters. State Police Organizations in India are structurally organized into various formations. The rank and hierarchical structure of the police organization is as following:



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A STUDY OF LEAN MANAGEMENT PRACTICES WITH SPECIAL REFERENCE TO SERVICE INDUSTRY

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ABSTRACT
All type of industry has put in continuous efforts forits survival in the current impulsive and competitive economy. In order to handle the critical situation, industries are trying to implement new and innovative techniques in their manufacturing as well as management process by making it more effective and efficient. One of such innovation technique is Lean Management. Lean management is an approach to running an organization that supports the concept of continuous improvement, a long-term approach to work that systematically seeks to achieve small, incremental changes in processes in order to improve efficiency and quality.

The study deals with the narration of facts and characteristics concerning the roles of Lean aspects, principles in the study environment, possible challenges and constraints to implement of the lean principles. The study adopted secondary source of data collections.

Keywords: Lean Management, Lean principles, continuous improvement.

INTRODUCTION

Lean refers to the process of documenting methods, processes, materials, tools, processing times and more. At its core, it is about ensuring your operations run as smoothly as possible and your process improvement strategy is constantly evolving and being adopted by your employees.However, for lean to deliver meaningful change to an organization, the implementers should first understand the organization and then introduce lean where it makes sense rather than the other way around. There are several key lean management principles that need to be understood in order to implement lean. Failure to understand and apply these principles will most likely result in failure or a lack of commitment from everyone in your organization. Without commitment the process becomes ineffective.The concept of lean not only used in manufacturing but also used in management, programming, start-up etc. Lean management seeks to eliminate any waste of time, effort or money by identifying each step in a business process and then revising or cutting out steps that do not create value. The philosophy has its roots in manufacturing.

Lean management and lean thinking are strongly linked. According to the leanthinking, the business has to be managed starting from the customer definition of value. The customer is the only one who determines whether or not a product/service satisfies his/her needs.Lean management is very much about asking questions and trying things, or encouraging others to try things. Lean management itself is not much about providing the right answer but it is very much about asking the right question.Applying lean management philosophy is one of the mostimportant concepts that help businesses to complete. In this paper titled "**A Study of Lean Management Practices with Special Reference to Service Industry**", the literature survey findings such as existing level of lean practices, types of lean tools, principles employed in service industry.

REVIEW OF LITERATURE

Womack et al. [87], [88], [89] recognize the Toyota Production System (TPS) as thefoundation of Lean Manufacturing and mention many of the tools and techniques used. The TPS is often represented as a house with strong foundations and solid pillars containing highly motivated people working to continuously improve.

Chan, K 1993 in his findings concluded that world-class companies realized the need to approach manufacturing in a balanced perspective, placing equal emphasis on structural, infrastructural, and integrating elements of strategy.

Comm1998 observed that leanness was becoming more prominent in most of the industries particularly in manufacturing as it reduces wastes and maximizes efficiency. This study explains how lean could be implemented and developed further in the service sector.

Richerson1999 studied lean practices at Boeing, where a new procedure called 'accelerated improvement workshop' was deployed successfully to implement the lean practices.

HeikoGebauer, et al, 2009 Briefs about the Lean organization applications in the pharmaceutical business.

Sua'rez-Barraza and Ramis-Pujol2010, identified several opportunities and inhibitors during the execution of lean kaizen in a Mexican public service organization. Activators and inhibitors are as follows.

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OBJECTIVES OF STUDY

1. To understand the difference between management and lean management.
2. To find out the current situation of lean management practices in service industries.
3. To find out the challenges faced by the organizations in the implementation of lean management practices.

HYPOTHESIS OF THE STUDY

1. There is relationship between lean manufacturing and lean management.
2. Lean management have positive impact on the efficiency of the organisation.

SCOPE OF THE STUDY

The scope of study is extended to understand the concept of Lean Management, area of study related to implementation of lean in service industry.

RESEARCH METHODOLOGY

The study focuses on extensive study of secondary data collected from company's websites, various national and international journals and articles, publications, conference papers, government reports, newspapers,industry reports and association in-house journalsandmagazines which focused on various aspects of lean manufacturing and lean management practices.

IN DEPTH ABOUT LEAN MANAGEMENT

"Management" is a distinct process consisting of activities of planning, organizing, actuating, and controlling, performed to determine and accomplish stated objectives with the use of human beings and other resources.

"Lean management" is a method that aims to improve the performance of an enterprise by developing all of its employees. The method helps operational teams identify the ideal conditions under which personnel, material resources, and the site can work together to add value with as little waste as possible. Lean has two objectives: the complete satisfaction of each business client (increasing the bottom line) and the personal success of each employee (increasing motivation and engagement).

THE LEAN TRADITION EMPHASIZES FUNDAMENTAL PRINCIPLES:

1. Understand What the Client Wants in Order to Define Value for The Service or Product Provided

Markets are competitive and dynamic the tastes and practices of clients are constantly changing. First and foremost, a lean enterprise must develop its ability to listen to its client base by resolving customer complaints and experimenting with new offerings.

2. Increase the Proportion of Just-In-Time Deliveries

This means reducing "lead time", the delay between the client's request and the delivery of a product or service. The trick to reaching this goal without increasing stock (or backlog) is to produce only what the client asks for, when it is asked for, and only in the proper amount.

3. Stop Production for Each Defect and Resolve the Problem Immediately, Rather Than Working around It

Delaying action prevents workers from seeing the precise conditions which created the problem, and hence resolving it and moving forward. Lean has developed several techniques to highlight, identify, and deal with problems in the time and place they arise, so that the employees themselves can discover root causes and find permanent solutions. These practices permit an enterprise to guarantee the quality of its products and services, while training its agents to work more effectively.

4. Involve Employees in Redesigning and Improving Their Work Environment

Through continuous training on standards (agreed-upon methods of working that minimize waste) and workshops promoting kaizen (progress by small steps), employees are encouraged to engage in the improvement of their own work stations, eliminate ergonomic stresses, and find clever ways of working more efficiently. The role of management is to support these daily actions of improvement, so that each person in the enterprise can share the sense of quality offered to the client and express their creativity in the work of production.

5. Lean Is Practiced In the Field, In Order to Reach Agreement with the Teams Over The Facts And True Nature of Their Problems

Lean does not distinguish between the experts who theorize and the workers who produce. Rather, it aims to develop the expertise of each person by putting in place a hierarchy founded on teaching and the transmission of experience. The goal of lean management is to develop the technical competence of each person and to understand how to work with colleagues upstream and downstream.

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6. Step by Step, Improvement by Improvement, the Lean Method Aims Above All Else to Build Confidence between The Enterprise And Its Clients, between Management And Employees, And between The Company And Its Suppliers

This confidence permits a collective engagement in the drive towards efficiency through the elimination of useless activities. Furthermore, every partner in the value chain reaps financial rewards: a better quality/price ratio for clients, jobs and bonuses for employees, higher activity and profits for suppliers, and growth and a better bottom line for the enterprise.

CURRENT SITUATION OF LEAN MANAGEMENT INSERVICE INDUSTRY

There is very little literature available on the implementation of Lean to the service industry. But the literature still lacks the empirical evidence to clearly explain how Lean can be implemented in pure context like insurance, finance and banking services, where the process automation has been used extensively.

In today's global economy, most of the companies offer services rather than building products. But most of these services companies are not performing well and they operate very inefficiently. Lean approach provides tools and techniques to improve those services to levels of quality and productivity seen so far only in production process. Further, the advent of personal computing technologies, high-speed networking systems, Internet infrastructure, and sophisticated software applications have contributed to the success of implementing lean in the service industry.

Services cannot be inventoried. Once the service is delivered, the customer experiences it, provide feedback, and expresses satisfaction or dissatisfaction. Consequently, service function must address customer problems must faster than any other function group. Most of the time, customers prefer quick service delivery to quality of services. For successful implementation of lean management in a service environment, one needs to understand and get more insight into the unique aspects of service processes. Identify and understand improvement opportunities, establish effective measurement system, and performance indicator before working through lean management.

In services delivery system customers experience service, there are no physical products to buy, or to inspect or to return. Therefore, defining a service defect is one of the most difficult tasks, and applying lean to service industry is very challenging.

Lean management is being slowly adopted by some service companies to improve their process to achieve quality customer satisfaction. In service industries, determining quality customer satisfaction depends on the kind of service that is being offered. But many of the experiences show that there are some fundamental criteria that can be applied to determine quality service in customer satisfaction. These include, response time to attend customer issues, the number of calls a customer makes to resolve an issue, amount of time the customer is placed on hold, and the process in place for the service function deliver value to the customer. The main objective of lean approach initiative is to reduce the number of bad customer experience to (Raisinghani*et al.*, 2005).

THERE ARE THREE MAIN REASONS WHY SERVICE COMPANIES NEED TO ADOPT LEAN MANAGEMENT

1. Typically, service processes are slow and can be expensive. Slow processes are usually susceptible to bad quality and therefore results in reduced customer satisfaction.
2. In service processes there is too much work-in-progress (WIP). This clogged WIP slows down the process and creates unnecessary complexity into the service. This situation leads to increased waiting time which in turn creates non-value added cost.
3. It is noted that the Pareto rule applies to slow processes – 80% of the delay is caused by 20% of the activities. Therefore improving the speed of that critical 20% of the activities will result in 80% reduction in cycle time (George, 2003).

OBSERVATION

1. Customer relations are heavily impacted by having backlog of service requests. A methodcalled Accelerated Improvement Workshop (AIW) is have to usein service companies toimplement lean techniques.
2. The lack of standard procedures, longer processing time, communication breakdowns withcustomer, inaccurate training, staffing, inadequate support from other functions are some ofthe reasons in the internal service systems. Upon avoiding all these lean principles can beimplemented in the service organisations.
3. Lean settlement, lean related function, lean application, monitoring and follow up, integrationand feedback alongside with the continuous improvement are stages of lean service implementation.

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4. From the research study it is also observed that management only related to getting things done from others whereas lean management is related to things are required to be done in such a way that it result in reduction in cost, improvement in quality and maximum customer satisfaction. So it is clear that management and lean management are two totally different things.
5. It is observed that Lean management and lean manufacturing are inline functions. Lean management positively related to the lean manufacturing. Without lean management lean manufacturing is not possible.
6. If all given lean management principles and techniqueefficiently implemented in service industry it has positive impact on the efficiency of the organisation.

THE CHALLENGES FACED BY THE ORGANIZATIONS IN THE IMPLEMENTATION OF LEAN MANAGEMENT PRACTICES IN SERVICE INDUSTRY.

1. Lack of Awareness for How to implement Lean Practices.
2. Employee Resistance against any change in management or management process.
3. Lack of Capital Fund for training and consulting.

CONCLUSION

Generally there is a misperception that lean practices can be effectively implemented only in the manufacturing sector. But this literature survey reveals that lean practices can be successfully implemented in service sector also leading to proven beneficial financial results and excellent customer satisfactions. Leanness is not only restricted to the tools but also it embraces the involvement of an active workforce. From overall study of paper it is conclude that lean management technique has indirect and positive impact on the performance of the service organisation if it is implemented efficiently.

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SOCIO-ECONOMIC PROFILE OF SUGARCANE PRODUCING FARMERS IN BARAMATI TAHSIL OF PUNE DISTRICT

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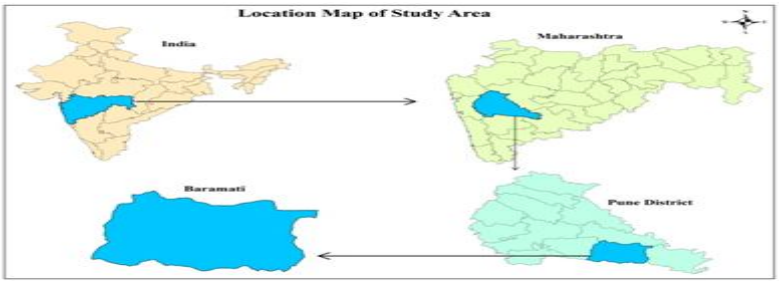
ABSTRACT
Sugarcane crop is important cash crop of India and it's growing on area of more than one million hectors of land. India is second largest sugarcane producing country in the world contributing 27 percent of world's sugarcane production; Also, India is the largest consumer of sugar in the world. Sugarcane industry is the largest agro based industry in rural India and acts as a focal point for socio-economic development. Sugarcane crop occupies important place in the economy of the Pune district. The district accounts 12.54% of the cane crushed in the state during 2016-17. Sugarcane is grown all over the district due to favorable climatic and soil condition except rainfall. The tahsils of Daund, Indapur, Baramati and Shirur occupies the largest area under sugarcane in Pune district. The study of socio-economic conditions generally precedes any attempt on the analysis of cultivation activities of different crop production. The study was conducted in Baramati tahsil of Pune district in Maharashtra state. For the purpose of the study, both primary and secondary information was collected from different sources. Some parameters are taken into consideration for the present investigation like education, size of family, occupations, caste, social participation, income, type of house, use of vehicles etc. The study of socio-economic parameters of sugarcane producing farmers reveals that, there is a good socio economic profile of sugarcane producing farmers of Baramati tahsil. The empirical results suggest that, there is large scope for further improvement in educational and social participation status, which will ultimately lead to socio-economic development of tahsil.

Keywords: Sugarcane, Socio-economic parameters, Farmers, Profile, Empirical etc

INTRODUCTION
Sugarcane is most important commercial crop of Pune district as like India and tropical countries. Sugarcane occupies important place in the economy of the district. The district accounts for 12.54% of the cane crushed in the state during 2016-17. Sugarcane plays a very important role in the rural economy of Pune district. It provides income for farmers and employment to the workers sections of the society. The study of socio-economic conditions generally precedes any attempt on the analysis of cultivation activities by different angles. The study of the economic conditions of farmer would also help in understanding the investment behavior of agriculturists on the land. The social and demographic features of the study would throw light on the attitude of the farmer on the adoption of modem methods of production and also the use of other non-labor inputs for the proper utilization of labor. Today, it is an urgent need to study the socio-economic characteristics of sugarcane farmers in Pune district for finding the impact of sugarcane farming on socio-economic development. Therefore an attempt is made here to analyse socio-economic profile of sugarcane producing farmers in Baramati tahsil of Pune district.

STUDY AREA
The Baramati tahsil lies in the eastern part of Pune district of Maharashtra. The geographical location of this tahsil is 18° 2′ 44'' N to 18 23′19'' North latitudes and 74° 13′ 8'' E to 74° 42′ 47'' East longitudes. The total geographical area (TGA) of the tahsil is 1382 sq.km. The river Nira flows west to east forming the southern boundary of the tahsil and the district. The river Karha flows northwest to south-east Baramati tahsil is bounded by Indapur tahsil towards the east, Satara district towards the south, Purandar tahsil towards the west and Daund Tahsil towards the north. Climatologically, it lies in the rain shadow zone of the Western Ghats and geomorphologically, it is located in the Karha and Nira basin, a part of middle Bhima basin. This is about 8.80 percent of TGA of the Pune district. The study area consists of 117 villages and according to 2011 census the total population of this tahsil is 429600. This tahsil consists of 117 villages and one urban centre.



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OBJECTIVES

The main objectives of this paper are as following

1. To study the social profile of sugarcane producing farmer in Baramati tahsil of Pune district

2. To study the economic profile of sugarcane producing farmer in Baramati tahsil of Pune district.

DATABASE AND METHODOLOGY

The study was conducted in Baramati tahsil of Pune district in Maharashtra state. For the purpose of the study, both primary and secondary information was collected from different sources. Data regarding to social and economic parameters of sugarcane producing farmers are collected through Primary data sources used for the year of 2017-18. For which special questionnaires were designed and field survey was conducted to obtain primary data. During the field survey, 10 villages were selected randomly. 12 farmers were selected from each village. The secondary data like cropped area and geographical information were collected through Agriculture Department, District Statistical Department of Pune and socio-economic abstract of Pune district in 2016-17. The collected data were compiled, tabulated and analyzed to interpret the results. The descriptive statistics like frequency and percentage were used for the investigation.

RESULT AND DISCUSSION

Baramati is one of the leading sugarcane producing tahsil of Pune district as well as in Maharashtra. Most of the farmers of Baramati tahsil are engaged in sugarcane farming activity. The area under sugarcane was 22127 hectares in Baramati tahsil in 2016-17. The highest area under this crop is registered at Shirasne lying in south (61.54 percent) whereas Sawal records lowest area (2.44 percent) locating in eastern part in the study area. The highest area under sugarcane crop in this tahsil is found in south and northeast parts due to irrigation, both by canal and lift. Moreover, soil of this region is fertile. There are three sugarcane industries in Baramati tahsil i.e. The Malegaon Sahakari Sakhar Karkhana Ltd Baramati, Shri. Someshwar Sahakari Sakhar Karkhana Ltd Baramati and Baramati Agro Ltd Baramati. These sugarcane industries play a significant role in the transformation of socio-economic conditions of farmers. Following table no. 01 shows the social and economic profile of sugarcane producing farmer in Baramati tahsil.

Table No-1: Socio-Economic Parameters of Sugarcane Producing Farmer in Baramati Tahsil

SR. NO	PARAMETERS	NO. OF RESPONDENTS	%
1	**Education**		
	Uneducated	10	8.33
	Up to 7th Standard	58	48.33
	8 to 12 standard	44	36.67
	Graduate and Post Graduate	08	6.67
2	**Size of Family**		
	Small Size(Up to 5 person)	35	29.16
	Medium Size(6 to 10 person)	66	55.00
	Large Size(more than 10 person)	19	15.84
3	**Occupations**		
	Only Farming	23	17.5
	Farming and Animal Husbandry	68	48.34
	Farming, Animal Husbandry and other	29	24.16
4	**Income**		
	Low income(Up to 1 lakh)	27	22.5
	Medium income (100001 to 2 lakh)	37	30.83
	High income(more than 2 lakh)	56	46.67
5	**Caste**		
	Open	51	42.5
	OBC	20	16.67
	N.T	39	32.5
	Other	10	8.33
6	**Social Participation**		
	No Membership	79	65.83
	Membership in one organization	25	20.83
	Membership in more than one organization	16	13.34

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7	**Use of Vehicles**		
	No Vehicle	11	9.17
	Only Two wheeler	58	48.33
	Two Wheeler and Tractor	30	25.00
	Two Wheelar,four wheeler and Tractor	21	17.5
8	**Type of House**		
	Pucca House	80	66.67
	Semi Pucca House	29	24.17
	Katcha House	11	9.16

Source: Fieldwork, December 2018.

1. Education

Education is the crux of social, economic, cultural and political development of the society. It may also boost the aptitude to acquire the information about new technology. The above table shows that, out of the total numbers of respondents of Baramati tahsil, 8.33 per cent farmers are uneducated. The large number of farmers is primary and middle level is educated. It covers 48.33 per cent share of all respondents. Table also shows that 36.67 per cent farmers are having high schooling and higher secondary level education. As compared to other level of education, the situation of higher education level educated farmers is very low, only 6.66 per cent farmers having higher education.

2. Size of Family

It refers to the members present in individual respondent's family. Here, families consisting of one to five members are being regarded as small size families while large size families consist of more than ten members. The above table no.1 indicated that majority of the sugarcane farmers belonged to the middle sized families' i.e. 6 to 10 members (55.00%), while 29.16 per cent of them belonged to small sized families having up to 5 members and only 15.84 per cent of the sugarcane farmers belonged to large sized families having more than 10 members.

3. Occupations

The occupation of a person is an important indicator to determine the economic status of the person in the society. The table no. 02 indicates that most of the sugarcane producing farmer (58.34) is doing farming and animal husbandry occupations. It means most of the farmers see animal husbandry as side business for agriculture. Out of the total sugarcane producing farmer 24.16 percent farmers engaged in farming, animal husbandry as well as other occupation like poultry farm, fishery, Private Business etc. 17.5 percent farmers are engaged in only farming activity.

4. Income

Income is the base of family. The table no.1 reveals that, 22.5 percent farmers are having low income, 30.83 percent farmers are having medium income but highest no of farmers are having high income that is 46.67 percent. It means the economic condition of the famers is good.

5. Caste

Table no. 01 shows that, 42.5 per cent of the sugarcane producing farmers are belonging to open categories, mostly dominated by Maratha caste. Nomadic tribe (N.T.) has 32.5 percent, followed by 16.67 percent has from other backward class (OBC), whereas other castes like S.C, S.T. and S.B.C. have only 8.33 percent from all respondent of study area.

6. Social Participation

It is clear from the table no.02, more than 65.83 % of the respondent had no membership in any organization, followed by 20.83 per cent had membership in one organizations and very little i.e. 13.34 per cent of sugarcane producing farmers had membership in more than one organizations. It is clear from above discussion, less than 34.17 percent sugarcane production farmers want to do something for our Society.

7. Use of Vehicle

Motor vehicle is one of the most significant parameter of economic status of a person. It is clear from the table no. 01 around 48.33% of the sugarcane producing farmers have only two wheeler vehicle, whereas 25.00 percent farmers have two wheeler and Tractor. Only 17.5 percent farmer has two wheeler, Tractor and four wheeler vehicles. There are 9.17 percent sugarcane producing farmer have no any vehicle.

8. Type of House

The possession of a house and the nature of the house are important indicators of socio-economic status of person. The table no. 01 indicates that most of the sugarcane producing farmers lives in pucca house (66.67%).

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Out of the total sugarcane producing farmer 24.17 percent farmers live in semi pucca house and only 09.16 percent farmer live in katcha house.

CONCLUSION AND SUGGESTION

From the above study we can conclude that, majority of the sugarcane producing farmers belonged to primary to middle level educated and mostly belonged to Open and N.T category. It is also found that most of the sugarcane producing farmers has high annual income (more than 2 lakh) with medium size of family and belong to joint family. They have farming plus animal husbandry as their main occupation. Social participation of sugarcane producing farmers is very low; majority of the sugarcane producing farmers have two wheeler vehicles and live in pucca house. Socio-economic parameters of sugarcane producing farmers reveal that there is a good socio economic profile of sugarcane producing farmers of Baramati tahsil. The empirical results suggest that, there is positive impact of sugarcane farming on socio-economic development of sugarcane producing farmer and also large scope for further improvement in educational and social participation status, which ultimately leads to the agriculture development of the study area.

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EFFECT OF E-REVIEWS ON ONLINE BOOKING ON STAR HOTELS

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ABSTRACT
Internet technology has brought about a rapid and unparalleled revolution in our personal and professional lives. The internet has changed the way of distribution of products, and the digital medium has made considerable progress in finding innovative ways of reaching out to the customers. This has caused the world to become a global marketplace. The decision making process of the digital customer has also undergone a change. One of the significant changes is evident in the role of online reviews. Reviews play a very critical role in the purchase decision and satisfaction post consumption. In case of the electronic transactions enabled by the use of technology, these have become even more critical. This research comprised of a questionnaire as the research instrument, to ascertain the role of online reviews, ratings and recommendation on online booking of star hotels. The questionnaire comprised of a five point Likert-type scale ranging from strongly agree to strongly disagree tested a sample size amounts to 683 respondents from Pune city based on judgement type of sampling method. The aim was to understand the effect of online reviews on the decision making process in all stages of the digital consumer behaviour – Pre consumption stage, Decision making stage and finally in the Post purchase stage. It was found that importance of electronic word of mouth (E-WOM) is getting a strong dependence and consumers rely on them during information search, alternatives' evaluation / selection and also during post purchase process. As the outcome of this study it is recommended that hospitality companies rise up to leveraging customer reviews to expanding their business and controlling negative ones thereby controlling damage it may cause. In today's times, reviews on the digital platform are more effective than company's own marketing claims.

Keywords: "Online Reviews", "Electronic Word-of-Mouth", "Online Hotel Reservations", "Consumer Generated Content".

INTRODUCTION
We are living in an era which is fuelled by technology. It is evident in the last couple of decades internet has witnessed an unprecedented growth. Owing to its speed and ability to reach out across sections, it has succeeded in shrinking geographical and physical boundaries. The word has now become a smaller place. Today, internet is extensively used for social media network, mobile apps, and other varied forms of digital communication. In the present day, electronic commerce has is limited to not only transacting goods, but also selling and services. Service-oriented products such as hotel room reservations, travel by air, rail, cruise, car rentals, all inclusive holiday packages, restaurant food delivery, home services such as cleaning and maintenance etc. are also gaining popularity selling it on the electronic medium like websites and mobile applications. In the business of making room reservations through online medium, online ratings, recommendations and reviews have arisen to play a significant role. Earlier, word of mouth was limited to known circle of family, friends and acquaintances. Now, owing to the electronic medium it has collapsed boundaries and spread across the world. It has provided a platform whereby communicating and influencing strangers from different countries is seamless and instantaneous. So much so that reviewers now have ardent followers, and their word is taken as a decision. Such is the power of online customer reviews, ratings and recommendations. This is the time and age of power of the reviewers, who have become influencer. These have started to exercise more power than experienced ever before. Web 2.0 has empowered two way flow of communication and also has made Social Media Network enabled social community more active. It is also extensively used for not just marketing by companies, but also by experienced customers to influence potential pr prospective customers who are looking to reserve hotel rooms online. Information is shared, posted, commented and liked instantaneously. This wide reach has become an opportunity as well as a threat for businesses. To use social media to the advantage of the business and keep negatives away by prompts recoveries and reverts has added to the profile of marketing.

SCOPE
The geographical scope of this research paper is restricted to fstudy of five and four star hotel establishments within Pune city. The profile of respondents is those who use these hotels for business and or leisure purpose. Analytical scope is studying the data by means of exel and SPSS software. Contribution scope includes useful findings and suggestions to the hotel industry as identifying the reach and extent that electronic word-of-mouth may utilised to the optimum.

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LITERATURE REVIEW

Chen, et. al., (2004), studied the impact of recommendations on sale of online products. He studied the sale of books online. He discovered that the books having recommendations lead to boost in sale of those books than those which have fewer reviews. More reviews are considered to be more popular and fewer reviews are considered to be less popular. Same may hold good for other goods and services sold online as well. Moreover, Hostler, et., al., (2011), stated that it was also found that recommendations systems also boost unplanned purchases and diversity of sale. Ghose and Yang, (2009), reflected that there exists a positive association between the rank of recommended product and success in conversion rate. It was found that occupying a higher position does not essentially help to earn a higher monetary benefit. Fodness and Murray, (1997), claimed that the success in hotel industry e-commerce activities lies heavily the success in garnering favourable customer reviews. This is possible if customers are delighted by the services of the hotel. Nunthapirat, (2016), elaborated that increasing number of prospective customers are depending on reviews and recommendation prior to making a purchase decision. He mentioned that in case of the hospitality services, especially booking a hotel room and eating out, he found that guests depend on checking the posts and comments online prior to making up their minds and actualizing the decision. Seung Hyun, (2012), laid that it is clear that travellers planning to book a travel, growingly prefer to interact with online travel sites so that they can conveniently collect information on placed, rates and other details. Varkaris, (2017), accounted how negative image and reviews by the general users that are posted after a bitter or unsatisfactory experience, creates hesitation in minds of potential customers and make them very reluctant in going ahead with that hotel's booking, even it was on their agenda. D'Ambra, (2004), supported the opinion that customers prefer to read unbiased information that is posted by customers who have experienced the product. The existence of reviews on social, media may be positive or negative. But it is found to be true that both these kinds of reviews have an impact on the customers' decision making journey. Ogut, (2016), reiterated that reviews by family and friends and trusted known sources have always been prevalent. But with the advent of social media and its popularity, reviews posted by even strangers have high credibility and decision making power. Papathanassis and Knolle, (2011), in this dynamic room booking process, customers gather and seek information from an array of variety of sources in order to reduce the ambiguity of quality which is a concern prior to making purchase decisions. Pathak et. al., (2010), remarked that recommendation systems pump sale as they are able to convert browsers into customers, make useful information available to the customers, present personalization, help build customer loyalty and also provide opportunities to cross-sell. Kamoen, et al. (2015), found that even positive and negative statements that may be direct or indirect also have varying effects. Like, "good" is considered more positive than "not bad", whereas both "bad" s well as "not good" have the effect which is alike.

Ög˘üt and Tas¸(2012), commented that higher when the reviews are favourable, then they successfully translate into actualization of purchase and also command customer ratings lead to higher online bookings and prices. There are two types of recommendation systems. The first is content-based and the second is collaborative filtering-based. Content-based ones are those recommendation system that use the history of the users' actions, and on its basis provide suitable recommendations. On the other hand, collaborative filtering is that system of recommendations which is based on the studied patterns of customers' preferences or actions which are then used to suggest recommendations. Kwok and Yu, (2016), also reiterated that review websites that are available online, and also communities in the cyber space have catapulted as the major influence as the source of information towards planning travels. Kwok et. al., (2015), added that especially in case of services of the varied travel products, the impact of eWOM available abundantly on social media network as well as other websites, is particularly significant and is greatly used. Xie, et. al., (2014), noted that the consumers growingly use reviews, recommendations and ratings that are available online. They not only use, but also more and more have started depending on them in order to make purchases. Ulrich, (2015), that in today's technologically driven era, the consumers are truly empowered. They can post reviews, freely and unabashedly, Electronic word of mouth is without any filters. They can also explain and discuss and hear back from the management. Labrecque et al., (2013), further confirmed that owing to this comprehensive knowledge from both sides makes it is easier than ever for prospective to compare and confirm claims and make sound purchase decisions with minimum risks. Also, largely positive customer reviews are easily accepted and endorsed by the concerned service companies, they need to be ready and equally accepting in case of negative ones as well. Lee and Youn, (2009), opined that a review is based on the experience of customers. In such a case, it may still lead to readers reading and believing the product to be inferior. The way of bailing out from the situation is that it is counter balanced with a lot of positive reviews. Rianthong, (2016), observed that online travel reviews have fast become a basis of extensive travel information and is extensively used by many travellers to reduce their purchase risk. Gretzel and Yoo, (2008), said that there are multiple dimensions based on which reviews are done. A few of these parameters are cleanliness, hygiene, safety, service, tangibles, location, sleep quality etc. On the other

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side, it was also regarded that high volume and not necessary reviews cause confusion to customers when they are trying to evaluate and decide.

OBJECTIVES

1. To explore the scope of online reviews.
2. To understand the effect of online reviews on online purchase decision of online bookings.
3. To study the perception of management's response from the perspective of digital bookers of hotel rooms.

HYPOTHESIS

Online reviews and ratings significantly affect online bookings of star hotels.

LIMITATIONS OF THE STUDY

The primary study is purely on the basis of their response. Also, the geographical study is limited to a particular city. For a broader and generalised understanding it has to be studied across multiple cities.

RESEARCH METHODOLOGY

Collection of Data

The primary data required for the research was collected using the following technique

- Data collection tool: Questionnaire
- Research Design: Descriptive
- Sample Type: Non Probability Judgment Sampling
- Sample size: 683

Apart from the above mentioned tools the relevant secondary data for the research was collected from journals, books & internet sources.

DATA ANALYSIS AND INTERPRETATION

The research collected extensive data based on online reviews and its direct and indirect impact on purchase of online hotel reservations. Of the total 683 respondents, majority agreed that online reviews positively impact room their purchase decision. Detailed analysis of the data is given below:

Table-1: Increased travel due to online medium

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	454	66	66
2	Agree	4	117	17	84
3	Undecided	3	65	10	93
4	Disagree	2	19	3	96
5	Strongly Disagree	1	28	4	100
Total			683	100	

It is evident from the survey that customers agree that their lifestyle pertaining travel and behaviour pertaining travel decisions has changed with the usage of technology. Owing to the digital platform of bookings, majority agreed that it has fuelled their want for travel. Of the 683 respondents, 84% agreed that advent and availability of technology and communication through the wired medium has increased the overall travel.

Table-2: Information search

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	422	62	62
2	Agree	4	147	22	83
3	Undecided	3	55	8	91
4	Disagree	2	29	4	96
5	Strongly Disagree	1	30	4	100
Total			683	100	

In the arena of electronic commerce, it is understood that availability of accurate and real-time information of the product plays an important part in all three stages of the consumer purchase process. Consumers seek information. The more effortless, speedy and accurate the information helps customers make their purchase decision faster and positive. Since the risk of purchase is high in case of online buying, as the product cannot be seen, felt, sampled or tried, all needed information needs to be provided. It is evident that 83% consumers solicit, seek and use the information as a basis to decide.

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Table-3: Increased travel due to online medium

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	454	66	66
2	Agree	4	117	17	84
3	Undecided	3	65	10	93
4	Disagree	2	19	3	96
5	Strongly Disagree	1	28	4	100
Total			683	100	

Of the 683 respondents, 84% agreed that advent and availability of technology and communication through the wired medium has increased the overall travel. These include the pre-purchase, purchase and post purchase stages. Customers refer to reviews, ratings and recommendations and they form as one of the basis on which decisions of buying are taken. Favourable reviews translate into favourable buying decisions and vice-versa.

Table-4: Influence of online reviews

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	343	50	50
2	Agree	4	127	19	69
3	Undecided	3	81	12	81
4	Disagree	2	48	7	88
5	Strongly Disagree	1	84	12	100
Total			683	100	

Half the respondents strongly agreed and 69% also agreed that they look up for reviews that are posted online. They admitted that reviews posted by strangers for the product that they are contemplating to buy, influence their final purchase decision. Not only review content, but also credibility of the reviewer, number of reviews,

Table-5: Post purchase reviews and recommendations.

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	366	54	54
2	Agree	4	114	17	70
3	Undecided	3	95	14	84
4	Disagree	2	41	6	90
5	Strongly Disagree	1	69	10	100
Total			685	100	

For by the digital consumer, reviews play an important part of his / her behaviour. During the post purchase and consumption phase, consumers actively share their experience and opinions by means of online reviews, ratings, blogs, comments, posts and pictures. As many as 70% agree that they indulge in writing reviews and recommendations. These have a bearing on the rating of the product, and are an important part in influencing future buyers towards or away from the product.

Table-6: Influence of online ratings

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	357	52	52
2	Agree	4	136	20	72
3	Undecided	3	64	9	82
4	Disagree	2	52	8	89
5	Strongly Disagree	1	74	11	100
Total			683	100	

Ratings refer to the stars, likes, thumbs up and other such pictorial signages are part of consumer generated content and symbolises like-ness or lack of it concerning a product, especially shared post experience. In the survey 72% agreed that online ratings influence the outcome of their purchase decision. This means that's ratings impact the buying decision. This is a considerable number of consumers who despite the company claims will be swivelled by customers' rating basis.

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Table-7: Influence of online recommendations

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	270	40	40
2	Agree	4	164	24	64
3	Undecided	3	88	13	76
4	Disagree	2	46	7	83
5	Strongly Disagree	1	115	17	100
Total			683	100	

A recommendation is simply a suggestion to use something. It is based on information that is experienced and analysed, and the recommendation is resultant of positive analysis decision. It was found that 64% are influenced by customer reviewer recommended products.

Table-8: Unbiased online customer reviews and pictures

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	364	53	53
2	Agree	4	151	22	75
3	Undecided	3	61	9	84
4	Disagree	2	38	6	90
5	Strongly Disagree	1	69	10	100
Total			683	100	

Majority of respondents, that is 75% agree that the reviews, posts, pictures posted by the customers are unbiased. This means that they are posted in an impartial way, and as they are. There is a strong element of honesty that is perceived by potential buyers when they come across customer posts. Owing which customer reviews and pictures have great credibility and influence on prospective buyers.

Table-9: Increased credibility of customer reviews and pictures

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	342	50	50
2	Agree	4	147	22	72
3	Undecided	3	74	11	82
4	Disagree	2	46	7	89
5	Strongly Disagree	1	74	11	100
Total			683	100	

It was found that when hotels put up pictures, these are seen as part of marketing promotion and communication, and as much attractive these might be, they are appreciated but not completely and blindly trusted for real. The reality of the physical evidence is through property pictures that are captured and posted by other guests and patrons. It is therefore average of 73% customers agreeing that customers pictures are free from bias, have greater credibility and are trusted more that those posted by the hotel company.

Table-10: Management response affects credibility

SN	Scale		Frequency	Percentage	Cumulative Percentage
1	Strongly Agree	5	352	52	52
2	Agree	4	133	19	71
3	Undecided	3	85	12	83
4	Disagree	2	49	7	91
5	Strongly Disagree	1	64	9	100
Total			683	100	

71% of the respondents of the survey agreed that they also consider and take into account the response of the management to the reviews, posts and comments made by customers. The response time, recovery, improvements etc., when shared with the customer in an apologetic, earnest way and the feedback is taken to improve its services than to make excuses or justify service gaps, plays a positive role in the minds of potential customers, despite the poor review.

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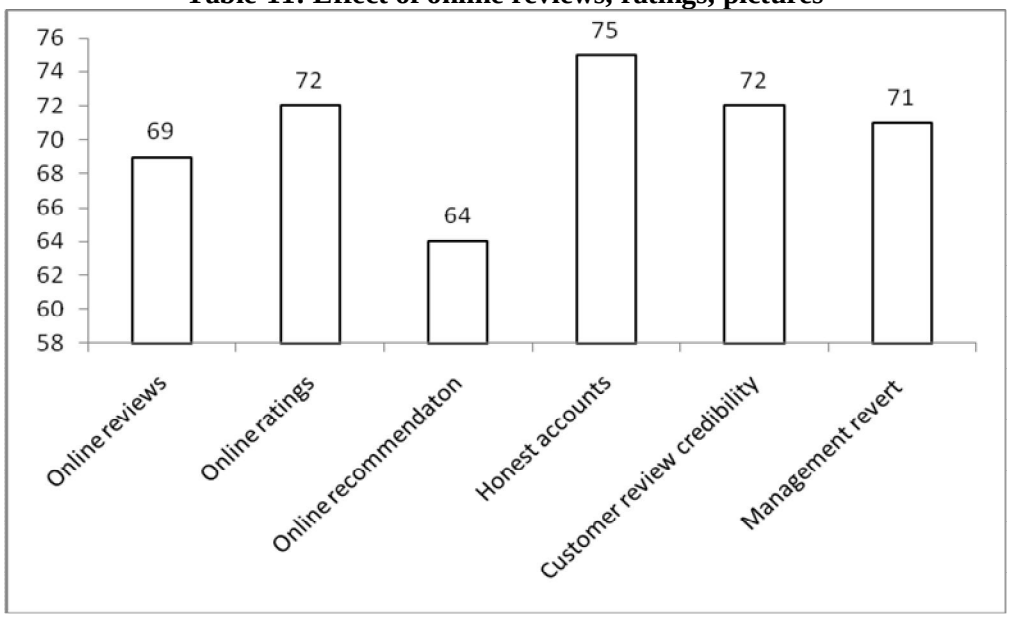
Table-11: Effect of online reviews, ratings, pictures



Hotel stay is a service product and cannot be sampled, tried or seen prior to purchase, makes it a risky buy. In such cases, which lack tangibility and sampling – reviews, ratings, recommendations, pictures, posts and comments provide the much needed measurement yardstick to the product. Further, when these come from actual customers who have experienced the product have great advantage of belief, credibility and influence on potential customers and most likely impact the sale in the direction of the customer comments.

HYPOTHESIS TESTING

Hypothesis H_0: Online reviews and ratings do not significantly affect online bookings of star hotels.

Test Used: Simple Regression

Test Result: $p<0.05$

Decision: Reject Null Hypothesis

Simple regression is a forced entry method which has been used to test the aforementioned hypothesis. In this method the predictor which is Online Reviews, is forced into the model. The following tables demonstrate simple regression analysis in detail.

Online Buying Behaviour mean is 4.1261 with the standard deviation 0.68897 and the mean for Online Reviews is 4.0363 with the standard deviation 0.80371.

It is noticed that along the diagonal of the matrix the values for the correlation coefficients are all 1.00 (i.e. a perfect positive correlation). The reason for this is that these values represent the correlation of each variable with itself, so the resulting values are 1. The correlation matrix is extremely useful for getting a an idea of the relationships between predictors and the outcome, and for a preliminary look for multicollinearity. If there is no multicollinearity in the data then there should be no substantial correlations ($r > .9$) between predictors.

The correlation between the Online Buying Behaviour and Online Reviews is significant at a .05 level ($r = .720$, $p < .05$). We can see also that of all of the predictors the Online Reviews correlate best with the outcome ($r = .515$, $p < .001$) and so it is likely that this variable will best predict Online Booking by customers for star hotels.

Table 4.35 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.720a	.518	.517	.47871	.518	731.653	1	681	.000	1.677
a. Predictors: (Constant), Online Reviews										
b. Dependent Variable: Online Buying Behaviour										

The R are values depict the extent of outcome by the said predictor. In this case, the correlation between Online Reviews and Online Buying Behaviour is at .720. The next column gives us the value of R2, which measuring the variability in the outcome which is accounted for by the predictor. **In this case it stands at .518, which means that Online Reviews accounts for 51.8% of the variation in Online Buying Behaviour.**

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ANOVA tests whether the model is significantly better at predicting the outcome. Specifically, the F-ratio represents the ratio of the improvement in prediction that results from fitting the model, relative to the inaccuracy that still exists in the model. The value of the sum of squares for the model represents the improvement in prediction resulting from fitting a regression line to the data rather than using the mean as an estimate of the outcome. The residual sum of squares represents the total difference between the model and the observed data. The 'df' is the degrees of freedom (df) for each term. In the case of the improvement due to the model, this value is equal to the number of predictors (1 for the model), and for SSR it is the number of observations (683) minus the number of coefficients in the regression model. Therefore, model has 681 degrees of freedom. The average sum of squares (MS) is then calculated for each term by dividing the SS by the df. The F-ratio is calculated by dividing the average improvement in prediction by the model (MSM) by the average difference between the model and the observed data (MSR). If the improvement due to fitting the regression model is much greater than the inaccuracy within the model then the value of F will be greater than 1, calculates the exact probability of obtaining the value of F by chance. For the model the F-ratio is 731.653, which is very unlikely to have happened by chance ($p < .000$). We can interpret these results as meaning that the model significantly improved our ability to predict the outcome variable, which means Online Reviews is quite able to predict the Online Buying Behaviour.

Table 4.36 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.636	.094		17.430	.000	1.452	1.820					
	Online Reviews	.617	.023	.720	27.049	.000	.572	.662	.720	.720	.720	1.000	1.000

a. Dependent Variable: Online Buying Behaviour

The b-values tell us about the relationship between Online Buying Behaviour and each predictor. If the value is positive we can tell that there is a positive relationship between the predictor and the outcome, whereas a negative coefficient represents a negative relationship. For these data all two predictors have positive b-values indicating positive relationships. So, in terms of the predictability the Online Reviews predict the Online Buying Behaviour. Finally with the regression analysis it is confirm that the Online Reviews affect positively to the Online Buying Behaviour. For our current model the VIF values are all well below 10 and the tolerance statistics all well above 0.2; therefore, we can safely conclude that there is no collinearity within our regression model.

On the basis of the multiple regression analysis out we reject the null and conclude that the Online Reviews positively affect the Online Buying Behaviour $F = 731.653$, $p < 0.000$ ($n = 683$).

FINDINGS

- Potential customers agree that reviews posted online influence their buying decision. Hence, it means that companies, and in this case hotels and booking sites need to ensure that services match claim, meet expectations and experiences are memorable so that they translate into positive reviews, ratings and recommendations leading to more sale.
    - Online reviews influence consumer buying when booking star hotels online.
    - Online ratings influence consumer buying when booking star hotels online.
    - Online recommendations influence consumer buying when booking star hotels online.
- Reviews posted by customers have an impact as they are seen as unbiased, without any ill intent rather viewed as a friendly sharing of information based on a personal experience.
- In situations when good as well as bad customer posts are reverted by the management of the said companies, it is viewed as a positive response and also increases the credibility of the company in the minds of potential customers.
- The importance of electronic word of mouth (E-WOM) is getting a strong foothold and consumers rely on them during information search, alternatives' evaluation / selection and also during post purchase process.
- Unlike traditional consumer behaviour model, online reviews are influencers and not restricted to family and friends. These may be across the globe, real-time and followed by many. Also, customers who seek reviews are also equally likely to post their experience post consumption of the service.

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- In consumer psychology, a few are influencers and like to be heard and followed. Internet technology has empowered them and they enjoy the access to reach out to the world and making their feelings known and endorsed. This way, online reviews have become a reality and consumers utilize them to share their personal experience post consumption.
- Credibility is increased when prospects read experiences shared by those who have experienced the product themselves.
- It is important for hotel companies that reviews are acknowledged and reverted to promptly, and in case of complaints, a correction and corrective action should be made and also communicated. This also is seen to increase credibility.

SUGGESTIONS

On the basis of the study of the respondents, it is recommended that

1. Online reviews cannot be controlled. The service product needs to be controlled in order to control reviews.
2. There are multiple sources of reviews. Posts and comments are shared on brand site, aggregator sites, OTA sites. These have to be reverted to instantaneously.
3. Also, managing the on line sites, especially social media network and pages need to be competitively updated and alive.

CONCLUSION AND DISCUSSION

The study was undertaken to understand the extent, prevalence and effect of online reviews on the actual buying decision of online hotel room bookings. It was found that consumers have not only accepted the interactive reviews, but also largely depend on them as a means of genuine information that helps them during various stages of consumer of their decision making journey.

FUTURE SCOPE FOR RESEARCH

Further study in the future may be undertaken for other categories of hotels as well. The study may include other cities. Analytics may be used to study in-depth. Furthermore, destination managed case study may also be opted for finer insights.

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MUTUAL FUND INVESTMENT: MOST PROFITABLE ALTERNATIVE FOR RETAIL INVESTORS

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ABSTRACT
It is rightly said that putting all eggs in single basket is risky than anything. There are individual investors facing the same problem while keeping their wealth with different financial institutions. I think there is lack of time and some fundamentals behind these problems. I guess retail investors who need to protect their wealth in this highly volatile market should understand some fundamentals before their call to fund manager to make some decent portfolios.

Investment in Mutual Fund is one of the best options for retail investors.

By pooling money together in a mutual fund, investors can enjoy economies of scale and can purchase stocks or bonds at a much lower trading costs compared to direct investing in capital markets. The other advantages are diversification, stock and bond selection by experts, low costs, convenience and flexibility. An investor in a mutual fund scheme receives units, which are in accordance with the quantum of money invested by him. These units represent an investor's proportionate ownership into the assets of a scheme and his liability in case of loss to the fund is limited to the extent of amount invested by him.

Keywords: Investment, Portfolio management, Retail investors, Wealth management

INTRODUCTION
The concept of Mutual funds has been on the financial landscape for long in a primitive form. The story of mutual fund industry in India started in 1963 with the formation of Unit Trust of India at the initiative of the Government of India and Reserve Bank. The launching of innovative schemes in India has been rather slow due to prevailing investment psychology and infrastructural inadequacies. Risk adverse investors are interested in schemes with tolerable capital risk and return over bank deposit, which has restricted the launching of more risky products in the Indian Capital market. But this objective of the Mutual Fund industry has changed over the decades. For many years funds were more of a service than a product, the service being professional money management. In the last 15 years Mutual funds have evolved to be a product. A competent fund manager should analyse investor behaviour and understand their needs and expectations, to gear up the performance to meet investor requirements. It is the time for mutual fund companies to understand the fund selection/ switching behaviour of the investors' and to design the fund schemes according to the changing needs of consumer, otherwise survival of funds will be difficult in future. The present study made efforts in this regard to suggest ways to penetrate this mode of investment deep in Indian society it also provides the information that what present investor expects.

Since the 1990's when the mutual fund space opened up to the private sector, the industry has traversed a long path, adapting itself continuously, to the changes that have come along. The Indian mutual fund industry is passing through a transformation. On one side, it has seen a number of regulatory developments, while on the other the overall economy is just recovering from the global crisis of 2008. Growth in Assets under Management (AUM) experience has been unprecedented, growing at a CAGR of 28% over the last four years, slowing down only over the last two years, as fallout of the global economic slowdown and financial crisis.

REVIEW OF LITERATURE
Madhusudhan V Jambodekar (1996) conducted his study to size-up the direction of mutual funds in investors and to identify factors influence mutual fund investment decision. The study tells that open- ended scheme is most favored among other things that income schemes, open-endedschemes, and income schemes are preferred over closed- ended and growth schemes. News papers are used as information source, safety of principal amount and investor services are priority points for investing in mutual funds. Sujit Sikidar and Amrit Pal Singh (1996) conducted a survey to peep in to the behavioural aspects of the investors of the North-Eastern region in direction of equity and mutual fund investment. The survey resulted that because of tax benefits mutual funds are preferred by the salaried and self-employed individuals. UTI and SBI schemes were catch on in that region of the country over any other fund and the other fund had been proved archaic during the time of survey. Syama Sunder (1998) conducted a survey with an objective to get an in-depth view into the operations of private sector mutual fund with special reference to Kothari Pioneer. The survey tells that knowledge about mutual fund concept was unsatisfactory during that time in small cities like Visakapatanam. It also suggested that agents can help to catalyse mutual fund culture, open-endedoptions are much popular than any other schemes, asset

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management company's brand is chief consideration to invest in mutual fund. Anjan Chakarabarti and Harsh Rungta (2000) emphasised to the importance of brand in ascertaining competence of asset management companies. Shankar (1996) suggested that for penetrating mutual fund culture deep in to society asset management companies must have to work and steer the consumer product distribution model. Raja Rajan (1997) underlined segmentation of investors and mutual fund products to increase popularity of mutual funds. Ippolito (1992) stats that investor is ready to invest in those fund or schemes which have resulted good rewards and most investors' is attracted by those funds or schemes that are performing better over the worst. Goetzman (1997) opined that investor's psychology affects mutual fund selection for investment in and to withdraw from fund. De Bondt and Thaler (1985) submitted that mean reversion in prices of stock is backed by investor's retrogression which is based upon investor's psychology to overvalue firm's resent performance in forming future expected results which is also known as endowment effect. Gupta (1994) surveyed household investor for the objective to find investors' preferences to invest in mutual funds and other available financial assets. The findings of the study were more relevant, at that time, to the policy makers and mutual funds to design the financial products for the future. Kulshreshta (1994) in his study suggested some guidelines to the investors' that can help them to select needed.

OBJECTIVES

An attempt was made in the present study entitled "Mutual Fund Investment: Most Profitable Alternative for Retail Investors" to understand the best alternative for investment and how this investment opportunity leads to better return and risk management.

To be specific following are the main objectives of the present research study

1. To study concept of mutual fund.
2. To understand how mutual fund is most profitable alternative for retail investors.
3. To compare the performance of different mutual fund schemes with the help of return on investment and NAV.

THEORETICAL BACKGROUND

What is Mutual Fund?

Mutual fund is a vehicle to mobilize moneys from investors, to invest in different markets and securities, in line with the investment objectives agreed upon, between the mutual fund and the investors. In other words, through investment in a mutual fund, a small investor can avail of professional fund management services offered by an asset management company.

Why Mutual Fund Schemes?

Mutual funds seek to mobilize money from all possible investors. Various investors have different investment preferences. In order to accommodate these preferences, mutual funds mobilize different pools of money. Each such pool of money is called a mutual fund scheme.

Every scheme has a pre-announced investment objective. When investors invest in a mutual fund scheme, they are effectively buying into its investment objective.

How do Mutual Fund Schemes Operate?

Mutual fund schemes announce their investment objective and seek investments from the public. Depending on how the scheme is structured, it may be open to accept money from investors, either during a limited period only, or at any time.

The investment that an investor makes in a scheme is translated into a certain number of 'Units' in the scheme. Thus, an investor in a scheme is issued units of the scheme. Under the law, every unit has a face value of Rs. 10.

When a scheme is first made available for investment, it is called a 'New Fund Offer' (NFO). During the NFO, investors may have the chance of buying the units at their face value. Post- NFO, when they buy into a scheme, they need to pay a price that is linked to its NAV.

Various investors subscribing to an investment objective might have different expectations on how the profits are to be handled. Some may like it to be paid off regularly as dividends. Others might like the money to grow in the scheme. Mutual funds address such differential expectations between investors within a scheme, by offering various options, such as dividend payout option, dividend re- investment option and growth option.

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ADVANTAGES OF MUTUAL FUNDS FOR INVESTORS

1) Professional Management

Mutual funds offer investors the opportunity to earn an income or build their wealth through professional management of their investible funds. There are several aspects to such professional management viz. investing in line with the investment objective, investing based on adequate research, and ensuring that prudent investment processes are followed.

2) Affordable Portfolio Diversification

Units of a scheme give investors exposure to a range of securities held in the investment portfolio of the scheme. Thus, even a small investment of Rs. 500 in a mutual fund scheme can give investors a diversified investment portfolio.

3) Economies of Scale

The pooling of large sums of money from so many investors makes it possible for the mutual fund to engage professional managers to manage the investment. Individual investors with small amounts to invest cannot, by themselves, afford to engage such professional management.

4) Liquidity

At times, investors in financial markets are stuck with a security for which they can't find a buyer – worse; at times they can't find the company they invested in! Such investments, whose value the investor cannot easily realise in the market, are technically called illiquid investments and may result in losses for the investor.

Investors in a mutual fund scheme can recover the value of the moneys invested, from the mutual fund itself. Depending on the structure of the mutual fund scheme, this would be possible, either at any time, or during specific intervals, or only on closure of the scheme. Schemes, where the money can be recovered from the mutual fund only on closure of the scheme, are listed in a stock exchange.

5) Tax benefits

Specific schemes of mutual funds (Equity Linked Savings Schemes) give investors the benefit of deduction of the amount subscribed (upto Rs. 150,000 in a financial year), from their income that is liable to tax. This reduces their taxable income, and therefore the tax liability.

6) Convenient Options

The options offered under a scheme allow investors to structure their investments in line with their liquidity preference and tax position.

There is also great transaction conveniences like the ability of withdraw only part of the money from the investment account, ability to invest additional amounts to the account, setting up systematic transactions, etc.

7) Investment Comfort

Once an investment is made with a mutual fund, they make it convenient for the investor to make further purchases with very little documentation. This simplifies subsequent investment activity.

8) Regulatory Comfort

The regulator, Securities & Exchange Board of India (SEBI), has mandated strict checks and balances in the structure of mutual funds and their activities. These are detailed in the subsequent Chapters. Mutual fund investors benefit from such protection.

9) Systematic Approach to Investments:

Mutual funds also offer facilities that help investor invest amounts regularly through a Systematic Investment Plan (SIP); or withdraw amounts regularly through a Systematic Withdrawal Plan (SWP); or move moneys between different kinds of schemes through a Systematic Transfer Plan (STP). Such systematic approaches promote an investment discipline, which is useful in long-term wealth creation and protection. SWPs allow the investor to structure a regular cash flow from the investment account.

TYPES OF FUNDS

1) Open-Ended Funds, Close-Ended Funds and Interval Funds

Open-ended funds are open for investors to enter or exit at any time, even after the NFO.

When existing investors acquire additional units or new investors acquire units from the open-endedscheme, it is called a sale transaction. It happens at a sale price, which is equal to the NAV.

When investors choose to return any of their units to the scheme and get back their equivalent value, it is called a re-purchase transaction. This happens at a re-purchase price that is linked to the NAV.

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Although some unit-holders may exit from the scheme, wholly or partly, the scheme continues operations with the remaining investors. The scheme does not have any kind of time frame in which it is to be closed. The on-going entry and exit of investors implies that the unit capital in an open- ended fund would keep changing on a regular basis.

Close-ended funds have a fixed maturity. Investors can buy units of a close-ended scheme, from the fund, only during its NFO. The fund makes arrangements for the units to be traded, post-NFO in a stock exchange. This is done through a listing of the scheme in a stock exchange. Such listing is compulsory for close-ended schemes. Therefore, after the NFO, investors who want to buy units will have to find a seller for those units in the stock exchange. Similarly, investors who want to sell Units will have to find a buyer for those units in the stock exchange. Since post-NFO, sale and purchase of units happen to or from counter-party in the stock exchange – and not to or from the scheme – the unit capital of the scheme remains stable or fixed.

Since the post-NFO sale and purchase transactions happen on the stock exchange between two different investors, and that the fund is not involved in the transaction, the transaction price is likely to be different from the NAV. Depending on the demand-supply situation for the units of the scheme on the stock exchange, the transaction price could be higher or lower than the prevailing NAV.

Interval funds combine features of both open-ended and close-ended schemes. They are largely close- ended, but become open-ended at pre-specified intervals. For instance, an interval scheme might become open-ended between January 1 to 15, and July 1 to 15, each year. The benefit for investors is that, unlike in a purely close-ended scheme, they are not completely dependent on the stock exchange to be able to buy or sell units of the interval fund. However, between these intervals, the Units have to be compulsorily listed on stock exchanges to allow investors an exit route.The periods when an interval scheme becomes open-ended, are called 'transaction periods'; the period between the close of a transaction period, and the opening of the next transaction period is called 'interval period'. Minimum duration of transaction period is 2 days, and minimum duration of interval period is 15 days. No redemption/repurchase of units is allowed except during the specified transaction period (during which both subscription and redemption may be made to and from the scheme).

2) Actively Managed Funds and Passive Funds:
Actively managed funds are funds where the fund manager has the flexibility to choose the investment portfolio, within the broad parameters of the investment objective of the scheme. Since this increases the role of the fund manager, the expenses for running the fund turn out to be higher. Investors expect actively managed funds to perform better than the market.

Passive funds invest on the basis of a specified index, whose performance it seeks to track. Thus, a passive fund tracking the BSE Sensex would buy only the shares that are part of the composition of the BSE Sensex. The proportion of each share in the scheme's portfolio would also be the same as the weightage assigned to the share in the computation of the BSE Sensex. Thus, the performance of these funds tends to mirror the concerned index. They are not designed to perform better than the market. Such schemes are also called index schemes. Since the portfolio is determined by the index itself, the fund manager has no role in deciding on investments. Therefore, these schemes have low running costs.

3) Debt, Equity and Hybrid Funds:
A scheme might have an investment objective to invest largely in equity shares and equity- related investments like convertible debentures. The investment objective of such funds is to seek capital appreciation through investment in this growth asset. Such schemes are called equity schemes.

Schemes with an investment objective that limits them to investments in debt securities like Treasury Bills, Government Securities, Bonds and Debentures are called debt funds.

Hybrid funds have an investment charter that provides for investment in both debt and equity. Some of them invest in gold along with either debt or equity or both.

DATA ANALYSIS
Following are the Best mutual fund according to CRISIL.

Data has been taken from moneycontrol.com and updated till Sept.27, 2017.

Large Cap	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
ABSL Top 100 (G)	54.70	14.5	2,262.79

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ABSL Top 100 - Direct (G)	57.17	15.9	572.59
Kotak Select Focus Fund - Direct (G)	32.42	17.8	2,550.98
Kotak Select Focus Fund - Regular (G)	30.99	16.4	8,040.18
SBI Blue Chip Fund (G)	35.44	9.3	10,099.40
SBI Blue Chip Fund - Direct (G)	36.94	10.6	3,480.61
Small & Mid Cap	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
L&T Emerging Businesses Fund-DP (G)	24.96	35.7	124.46
L&T Emerging Businesses Fund-RP (G)	24.37	34.6	831.38
L&T Midcap Fund (G)	133.60	29.4	817.52
L&T Midcap Fund -Direct (G)	138.71	30.5	83.92
Mirae Emerging Bluechip Fund (G)	46.39	23.2	3,306.87
Mirae Emerging Bluechip -Direct (G)	48.50	24.2	514.41
Diversified Equity	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
ABSL India GenNext (G)	73.43	13.4	506.14
ABSL India GenNext-Direct (G)	76.83	14.8	64.29
Motilal Focused Multicap 35 -DP (G)	25.93	23.6	2,613.75
Motilal Focused Multicap 35 -RP (G)	25.08	22.5	4,029.32
Principal Emerging Bluechip(G)	99.38	20.9	876.14
Principal Emer-Bluechip -Direct (G)	103.39	22.1	123.85
Sundaram Rural India Fund (G)	39.78	16.0	1,044.14
Index	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
Kotak Nifty ETF	98.40	11.8	515.54
Debt Long Term	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
ICICI Pru Long Term - Direct (G)	21.85	9.8	1,064.66
ICICI Pru Long Term Plan-RP (G)	40.68	9.2	9.05
SBI Dynamic Bond Fund (G)	21.42	8.8	1,636.25
SBI Dynamic Bond Fund - Direct (G)	22.08	9.5	1,413.67
UTI Dynamic Bond Fund (G)	19.92	9.4	1,136.05
UTI Dynamic Bond Fund - Direct (G)	20.51	10.3	389.95
Debt Short Term	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
HDFC Medium Term Opport. (G)	18.87	8.0	1,713.30
IDFC SSIF - MTP - Regular (G)	28.64	7.4	1,818.44
IDFC SSIF - MTP - Direct (G)	29.59	8.1	1,662.54
LIC Income Plus Fund (G)	21.19	6.9	125.13
LIC Income Plus -Direct (G)	21.91	7.5	438.08
Tata Short Term Bond - Direct (G)	32.70	8.0	4,074.03
UTI Banking & PSU Debt-Dir (G)	13.89	8.4	1,230.66

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Gilt Long Term	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
Reliance Gilt Sec. - Direct (G)	24.04	9.8	612.23
Reliance Gilt Sec. - RP (G)	22.88	8.5	584.06
SBI Magnum Gilt - LTP - Direct (G)	39.25	10.2	1,143.75
UTI Gilt Advantage - LTP (G)	38.33	10.6	243.64
Balanced	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
HDFC Balanced Fund (G)	139.81	14.2	9,818.56
HDFC Balanced Fund - Direct (G)	145.58	15.5	1,530.81
Liquid	**NAV** (Rs./Unit)	**1 yr Return** (%)	**AUM** (Rs.cr.) **Jun 17**
Indiabulls Liquid Fund (G)	1,633.85	6.9	620.63
Indiabulls Liquid Fund -Direct (G)	1,641.32	7.0	6,358.73
JM High Liquidity (G)	45.82	6.8	1,598.55
JM High Liquidity Fund -Direct (G)	45.99	6.9	3,848.94
Kotak Liquid - Plan A - Direct (G)	3,404.36	6.8	7,768.52
Kotak Liquid - Plan A - Regular (G)	3,396.46	6.7	5,119.57

DATA ANALYSIS

1) Large Cap And Small & Mid Cap Funds

1 yr Return % (LC)	**1 yr Return % (SMC)**
14.5	35.7
15.9	34.6
17.8	29.4
16.4	30.5
9.3	23.2
10.6	24.2

NAV (LC)	**NAV (SMC)**
54.7	24.96
57.17	24.37
32.42	133.6
30.99	138.6
35.44	46.39
36.94	48.5

Return

Mean	14.08333	Mean	29.6
Standard Deviation	3.396125	Standard Deviation	5.161008

Corelation: 0.711913

NAV

Mean	41.27667	Mean	69.40333
Standard Deviation	11.57509	Standard Deviation	52.68617

Corelation: -0.77649201

Conclusion: Average return of Small & Mid Cap fund shows growth than that of Large Cap Funds and Net Asset Value of Small & Mid Cap fund also shows growth than that of Large Cap Funds. However Positive correlation in one year return but negative correlation in NAV.

2) Diversified Equity, Debt Long Term and Debt Short Term Funds

1 yr Return %(DV)	**1 yr Return% (DLT)**	**1 yr Return % (DST)**
13.4	9.8	8
14.8	9.2	7.4

NAV (DV)	**NAV (DLT)**	**NAV (DST)**
73.43	21.85	18.87
76.83	40.68	28.64

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23.6	8.8	8.1	25.93	21.42	29.59
22.5	9.5	6.9	25.08	22.08	21.19
20.9	9.4	7.5	99.38	19.92	21.91
22.1	10.3	8	103.39	20.51	32.7
16		8.4	39.78		13.89

Return

Mean	19.04286	Mean	9.5	Mean	7.75714286
Standard Deviation	4.175666	Standard Deviation	0.513809	Standard Deviation	0.51269596

Corelation: -0.22944

NAV

Mean	63.40285714	Mean	24.41	Mean	23.82714
Standard Deviation	33.17894398	Standard Deviation	8.01256	Standard Deviation	6.696414

Corelation: 0.315509779

Conclusion: Average return of Diversified funds shows growth than that of Debt Long Term funds and Debt Short Term Funds and Net Asset Value of Diversified funds shows growth than that of Debt Long Term funds and Debt Short Term Funds. However Negative correlation in one year return but positive correlation in NAV.

3) Gilt Long Term & Liquid Funds

1 yr Return % (GLT)	1 yr Return % (Liquid)	NAV (GLT)	NAV (Liquid)
9.8	6.9	24.04	1,633.85
8.5	7	22.88	1,641.32
10.2	6.8	39.25	45.82
10.6	6.9	38.33	45.99
	6.8		3,404.36
	6.7		3,396.46

Return

Mean	9.775	Mean	6.85
Standard Deviation	0.910586	Standard Deviation	0.104881

Corelation: -0.76217

NAV

Mean	31.125	Mean	1694.633
Standard Deviation	8.871394103	Standard Deviation	1500.835

Corelation : -0.997851148

Conclusion: Average return of Gilt Long Term fund shows growth than that of Liquid funds, however Net Asset Value of Liquid funds shows growth than that of Gilt Edge Funds. However Negative correlation in one year return and also negative correlation in NAV.

KEY FINDINGS

1. Mutual fund is the best alternative for investment.
2. Retail investors should make systematic investment in various mutual fund schemes.
3. Average return of Small & Mid Cap fund shows growth than that of Large Cap Funds, Debt Long term, Debt Short Term, Gilt edged funds and liquid funds
4. Net Asset Value of Liquide funds shows growth than that of Large Cap Funds, Debt Long term, Debt Short Term, Gilt edged funds and liquid funds
5. ABSL Top 100 (G) and Kotak Select Focus Fund - Direct (G) from large cap have provided very good returns over last one year.
6. L & T emerging businesses fund – DP (G) and L & T emerging businesses fund – RP (G) from Small- mid cap have given best return . Return is about to 35% however NAV of these funds remain at lower end as compare to other fund from the segment.

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7. ABSL India GenNext (G) and ABSL India GenNext Direct (G) from diversified equity have shown tremendous NAV however, their returns over last year remain low as compare to other funds from this segment.
8. ICICI Pru Long Term - Direct (G)and ICICI Pru Long Term – Plan RP (G) belongs to debt long term has been remained at the top in both one year return and NAV.
9. IDFC SSIF - MTP - Direct (G) and Tata Short Term Bond - Direct (G) from debt short term have shown a moderate return but NAV is better than other funds in the same segment.
10. SBI Magnum Gilt - LTP - Direct (G) and UTI Gilt Advantage - LTP (G) from Gilt long term are showing better return and acceptable NAV in the segment.
11. HDFC Balanced Fund (G) and HDFC Balanced Fund (G) are attracting investors for investment and good return over nest few years.
12. Indiabulls Liquid Fund (G)and Indiabulls Liquid Fund Direct (G)from Liquidity segment are providing less return however NAV is far better than any other funds from all segments.

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EMPOWERING RURAL YOUTH IN INDIA FOR 21ST CENTURY THROUGH FINANCIAL INCLUSION

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ABSTRACT
The majority of disadvantaged and low-income sections in rural India remain outside the formal financial system, and this study explores the various initiatives taken by the Government of India to eradicate various bottlenecks found while disseminating financial instruments to all strata of society. Besides, it explores remedial actions to be taken for meaningful financial inclusion amongst rural youth.With its majority population coming under the unique umbrella of youth, India carries a unique demographic advantage. This advantage can be leveraged into the demographic dividend by equipping our youth with the requisite skillset. Asserting that financial inclusion is indispensable to achieving long-term economic growth, it proposes strategies for attaining the twin goal of consumer protection and financial awareness, by mapping the financial needs of rural youth to its aspirations in 21stcentury. A valuable roadmap on the topic of financial inclusion, this study attempts to lay foundation for the development economists, policymakers, and all other stakeholders in formulating a definitive steps to be undertaken to make Financial inclusion a successful phenomenon.Our paper will focus on the holistic empowerment of rural youth in India chiefly focusing on their attainment of financial literacy in terms of leveraging various beneficial schemes in banking and finance sector.

Keywords: Demographic dividend, Financial literacy

INTRODUCTION
Empowerment is the process by which an individual or group attains self-reliance through the access to resources and control over their respective lives. This facilitates the attainment of the individual as well as collective aspirations and life goals. Financial inclusion refers to delivery of financial services at affordable cost to the disadvantaged and low-income segments of the society. This contradicts the financial exclusion which enumerates the provision of financial services which are not affordable and available to all sections of the societalstructure.

India has a dominant and vibrant youth population with about 65 per cent under the age of 35 years. While most developed nations are bestowed with an ageing workforce, India is going to have a conducive demographic profile. According to Ministry Statistics, Government of India, the nation has seen a remarkable rise in the population of youth with 34 per cent in 2011 to an astounding figure of 65 per cent in 2017. This provides the nation with an unparalleled demographic advantage to the contemporary nations in theworld.

One of the primary goals of Financial Inclusion is emancipating the poor sections of the society from the shackles of traditional money lending machinery which was not only exploitive but also detrimental to the progress of the rural youth on entrepreneurial front. Financial inclusion encapsulates easier modes of capital provision as well as remittances. Furthermore, it also includes sustenance of financial literacy and consumerprotection.

According to the apex banking institution Reserve Bank of India,Financial inclusion, essentially, involves two elements, one of access and the other of awareness. As a result, consumers, investors in India should comprehend the financial products and financial concepts. They should exhibit confidence while utilizing these products, embracing the financial risks associated with them. The comprehensive knowledge of financial tools should enable them to take an informed decision, eventually leading to the improvement in their financial well-being.

Expanding their horizon beyond the problems faced by rural youth consumers and investors, Reserve Bank of India has ascertained the multiple difficulties faced by Micro and Small Enterprises (MSEs). They have expanded their attention on easier access to finance to SMEs through an active synergy among technology, new business practices and modern organisational structures.

LITERATURE REVIEW
According to Paramasivan. C, V. G. (2013), the primary aim of financial inclusion involves at disseminating all banking and financial services to all strata of society in India without any partisan attitude. It further elaborates on the cruciality of Consumer protection and financial awareness in accomplishing the finishing touches to these noble initiatives.

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Getting to the depth of financial inclusion initiatives, Mr. Nanjibhai D. Ranparia (2013) has evaluated the growth profile and current status of financial inclusion of Gujarat. It has included a comprehensive study of various financial dimensions to determine the success of these initiatives.

Dr. Anupam Sharma and Ms. SushmitaKukreja (2013) has reiterated the stance of the significant role played by financial inclusion in empowering the country's position in relation to other countries economy. It has reached to this crucial inference while taking note of secondary data sources derived from RBI, NABARD and several books,articles written by eminent authors.

RESEARCH OBJECTIVES

1. To enlist the implications of policy initiatives launched by Indian Government to accentuate financial inclusion in the rural youthpopulation,
2. To analyse the efficacy of the policy initiatives namely PradhanMantri Jan-DhanYojana (PMJDY) and Micro Units Development and Refinance Agency (MUDRA) loans in attaining their primary goal of financialinclusion,
3. To demonstrate the pragmatic implementation of these policy measures in the rural societal framework, suggesting the future scope of its expansion andrefinement.

HISTORY OF FINANCIAL INCLUSION IN INDIA

India has long considered its youth as the one who could contribute to its holistic development and growth in the rural and urban area. It had led to the creation of a myriad of initiatives in the past. Chronologically speaking, Lead Scheme founded in 1969 was followed by the nationalization of Scheduled Commercial Banks. The interest rates extended to the weaker sections of the society underwent corrective regulation. Establishment of Regional Rural Banks in 1975 was followed by the creation of Credit Cooperatives in 1980 to catalyse the financial access to rural youth for their budding enterprises. Self Help Group Bank Linkage Programme and newly licensed private sector banks in '90s have become major drivers behind this financial inclusion program of the Indian government.

Despite employing various initiatives, RBI failed to attain its expected level of Financial inclusion amongst the rural youth. With the active participation from Self Help Groups (SHGs) and Non-government Organisations (NGOs), Indian Government formulated "Business Facilitator and Business Correspondent model". According to N Kolloju (2014),

Financial Inclusion committee has highlighted the intrinsic role to be played by various initiatives in enhancing the higher disposable income of rural households. Large scale proliferation of financial services like credit, savings, insurance facilities, easy cash disbursement through Automated Teller Machines (ATMs) has made a tremendous impact on rural youth especially in their preferences for household consumption, self-employment , poverty alleviation as well as the welfare of the common people, Banerjee, Duflo, Glennerster&Kinnan2013.

With the advent of digital revolution spearheaded by World Wide Web and affordable networking infrastructure, the access to various financial products and services has become a tip of tongue for the common man. Besides, exponential growth in the number of Bank branches, Business Correspondents, Bank Customer Executive, and Kisan Credit Cards have further facilitated the conducive environment in financial inclusion of Rural youth population. Going by the prognosis as performed by the Brookings Institution, India's GDP would rise by US$ 1 trillion by 2020 if the entire India goes online. Broadband connectivity will facilitate attaining this objective in 21st century.

PRADHANMANTRI JAN-DHANYOJANA (PMJDY)

PradhanMantri Jan-DhanYojana (PMJDY) conceived by the government, is a step forward towards its pathway in attaining the long-term mission of financial inclusion covering all strata of society. It was launched by Hon Prime Minister of India, MrNarendraModi on 28th August 2014 to encompass their wide streamed motto of "Sab kaSaath Sab kaVikas" to streamline faster access to financial services namely Savings Accounts, Insurance, Credit, Remittance and Pension schemes in an affordable manner. The scheme offers various incentivesnamely insurance coverage, RuPay cards, Overdraft facility along with the direct benefit transfers (DBTs). The founding pillars of this scheme are:

Universal access to banking facility: This is one of the most predominant goal of PMJDY where the government is committed to reduce and eliminate all possible exclusions in financial domain. This can be accomplished by segregating the entire district into subservice zones constituting 1000 to 1500 households. It is directed to provide the basic banking facility to all rural households by 14th August2015.

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PROVIDING BASIC BANKING ACCOUNTS WITH OVERDRAFT FACILITY AND RUPAY DEBIT CARD TO ALL HOUSEHOLDS

This pillar can be built by facilitating the opening of the basic banking accounts for all households by 14th August 2015. Besides, each account holder would be equipped with a RuPay Debit Card.Once the account holder has established his credentials with a satisfactory operation history covering a period of six months, he will be rewarded with Overdraft facility.

Financial Literacy Program: Financial literacy is an intrinsic pillar of PMJDY with imparting the necessary knowledge of the banking facilities to all rural population.

Creation of Credit Guarantee Fund: Credit Guarantee Fund would cover the requisite information on defaults in overdraft accounts.

MICRO INSURANCE

Under this pillar the government has shown its deep commitment to provide micro-insurance to all eligible people by 14th August 2018. This process will be continued till it has attained its predetermined objective

Unorganised sector pension schemes like Swavalamban: Pension schemes will be implemented to cover all households by 14th August.

PMJDY proved to be a phenomenal success with 8.76 crore savings bank accounts opened within 100 days of itsinception.

MICRO UNITS DEVELOPMENT AND REFINANCE AGENCY (MUDRA) LOANS

Micro, Small and Medium Enterprises (MSME) sector has been one of the most vibrant and highly growth oriented sector in the Indian economy with colossal potential. The irony lies with the underexposure of this sector to the novel initiatives. There are around 51 million MSME units in the country with a unique distinction of employing approximately 11.7 crore people across various sectors. Besides, it is also one of the largest contributor of employment covering 40 per cent of the workforce. MSME contributes around 37 per cent to the total non-agricultural Gross Domestic Product (GDP) and an astounding 43 per cent to the total exports. Glorifying the Indian ethos of uplifting all sections of the society at the similar economic level, the backward communities of SC,ST and OBCs have spearheaded this MSME revolution.

MUDRA is a financial institution founded in 2016 by the Government of India for development and refinancing of micro enterprises. Based on its magniloquent goal of “Funding the Unfunded”, MUDRA is aspired to provide microfinance to the non-corporate business sector working on smaller scale. This can be accomplished by the effective utilization of last-mile financial institutions. It comprises credit plus services including financial literacy and other social supportservices.

ANALYSIS AND DISCUSSION

The implementation of MUDRA loans disbursed and the respective beneficiaries added in the process to MSME sector is shown below:

Loan Category/Amount In INR	Sanction Amount in Crore for 2017-18 (per cent)	No of Loan Accounts in 2017-18, (per cent)
Shishu (loan up to INR 50000)	106002 (41.78)	42669795 (88.65)
Kishor (loan of above INR 50000 and upto INR 5 lakhs)	86732 (34.19)	4653874 (9.67)
Tarun (loan above INR 5 lakhs up to 10lakhs)	60943 (24.02)	806924 (1.68)
Total	253677	48130593

Source: MUDRA website

As shown in the above table, it can be inferred that Shishu loan constitutes the highest share of around 42 percent with respect to the sanctioned loan amount. The gigantic contribution by Shishu loan in MSME sector is followed by the contribution by Kishor loans (34 %) and Tarun (24 %). To boost the ever expanding plateau of MUDRA loans, Government of India announced a scheme for sanction of loan up to INR 1 crore within 60 minutes for newly conceived MSME. This measure was introduced to catalyse entrepreneurial spirit among rural youth and ease of access to the institutional credit to MSMEs.

The flagship program of the Government of India towards achieving the financial inclusion among rural youth has produced some fascinating statistics as given below:

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Type of Banks	Number of Total Beneficiaries (in crores)	Deposits in Accounts (in crores)	Number of RuPaydebit cards issued (incrores)
Private sector banks	1.04	2421.62	0.97
Public sector banks	26.91	67803.72	21.72
Regional rural banks	5.51	14589.20	3.75
Grand Total	33.46	84814.54	26.44

Source: PMJDY website

PMJDY has led from the forefront towards accumulating a colossal amount of INR 84815 crore in the form of savings bank accounts. During the same period, 26.44 croreRuPay debit cards have been issued to the beneficiaries till December,2018.

The following table will highlight the progress profile of financial inclusion in India

Financial inclusion data	March 31, 2010	March 31, 2018
Total banking outlets in Villages (inthousands)	68	570
Total basic savings bank deposits (inmillions)	73	536
Total basic savings bank deposit accounts (INR in billions)	55	1121
Kisan Credit Cards (in millions)	24	46
KCC (INR in billion)	1240	6096
General Credit Cards (in millions)	1	12
GCCs (INR in billion)	35	1498

Source: RBI website

As shown above, savings bank deposits has risen manifold by around 8 times during the period 2010-2018 while number of savings bank account has increased exponentially to over 20 times than the original number. The credit disbursed to KCCs as well as GCCs has propelled higher and higher to reach dizzy heights. This astounding growth is well corroborated by banking outreach to comprise 570000 outlets during the 8 year tenure lasting 2010 to2018.

License to the late entrant Payment Banks and the ubiquitous Postal Payments Bank is going to spur the growth of financial inclusive beneficiaries in farthest areas of rural India.

CHALLENGES

Provision of high-speed broadband connectivity "BharatNet"

Despite the favourable estimates as given by the Brookings Institution towards achieving US$ 1 trillion as Gross Domestic Product, we can't forgo the prerequisites towards achieving this herculean task. "BharatNet", a unique initiative launched to connect entire India with the high- speed broadband connectivity must make rapid inroads in accomplishing the task by furnishing the Gram Panchayat machinery with digital connectivity at affordable tariffs.

Ascertainment of consistency in using banking services by Rural consumers

PMJDY has yielded an incredible record-opening with around 8.76 crore savings bank accounts in meagre 100 days. However, taking into consideration the ground reality, this momentum should maintain the consistency in use of banking services at regular intervals with reasonable cost.

Lack of Awareness of other beneficial initiatives

Apart from PMJDY and MUDRA , India has initiated a plethora of initiatives namely Make in India, Skill India, Startup India, Stand-up India to formulate an eco structure to promote entrepreneurial opportunities for the rural youth. However, youth brethren in rural India still lacks the sufficient knowledge about these unique league ofschemes.

CONCLUSION

A true pathway towards empowerment of the rural youth is complete only when it has achieved the financial inclusion in every aspect of human life namely savings, credit, insurance, pension, remittances and financial advisory services.

When financial institution is staffed by local people exerting a local control at large, the financial inclusion initiative would be more beneficial and effective. A major thrust is needed to the employment of Business Correspondents (deposits), certified Credit Counsellors (loans), Trade Electronic Receivables discounting system. An intelligent rural financial inclusion framework would constitute Rural Self Employment Training

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Institutes and Farmers Producers Organizations to address the areas of capacity building for rural youth and supply chain management for farmers, artisans respectively in the rural India.

Financial literacy and Consumer Protection are two critical factors behind the successful conclusion of financial inclusion journey. Lack of either of them may result in the vicious circle of debt trap for the rural youth. Banking system in India should synergise with education system effectively by encompassing a compulsory subject at different levels right from school to higher levels of education.

After building the necessary technical framework, the next important stage would aspire in bringing a cultural shift and mindset transformation.

To sum up, implementation of the successful financial inclusion in rural young community would entail educating people, disseminating financial and digital awareness and imparting the necessary know-how about the duties and rights of ruralenterprises.

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ANT BASED SELF-ORGANIZED ROUTING PROTOCOL FOR WIRELESS SENSOR NETWORKS

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ABSTRACT
The field of wireless sensor networks (WSNs) is an important and challenging research area today. Advancements in sensor networks enable a wide range of environmental monitoring and object tracking applications. Moreover, multihop routing in WSN is affected by new nodes constantly entering/leaving the system. Therefore, biologically inspired algorithms are reviewed and enhanced to tackle problems arise in WSN. Ant routing has shown an excellent performance for sensor networks. Certain parameters like energy level, link quality, lose rate are considered while making decisions. These decisions will come up with the optimal route. In this paper, the design and result of ant based autonomous routing algorithm for the sensor networks is presented. The proposed bio-inspired self-organized algorithm will also meet the enhanced sensor network requirements, including energy consumption, success rate and time.

I. INTRODUCTION

Recent advances in MEMS (Micro-Electro-Mechanical Systems) technology and wireless communications have led to small and low-cost sensors with increasingly powerful processing and networking capabilities. Sensor networks may comprise many sensor types, capable of monitoring a diversity of surrounding conditions, including temperature, humidity, lightning condition, pressure, noise levels, the presence or absence of

particular objects and the object properties such as speed, direction and size. Additionally, many various domain applications, such as factory automation, chemical pollution monitoring, healthcare, and security adopt sensor computing. Figure 1.1 illustrates the communication architecture of wireless sensor computing. Up to thousands of sensor nodes are spread across a geographical area to monitor ambient conditions as mentioned. They cooperate with each other to form a sensing network, providing access to surrounding information anytime, anywhere. A sink may function as a powerful stationary sensor node, or a mobile hardware device carried by users to gather all sensing messages sent from multiple sensor nodes. While gathering messages successfully, sinks process and forward essential data to administrators via

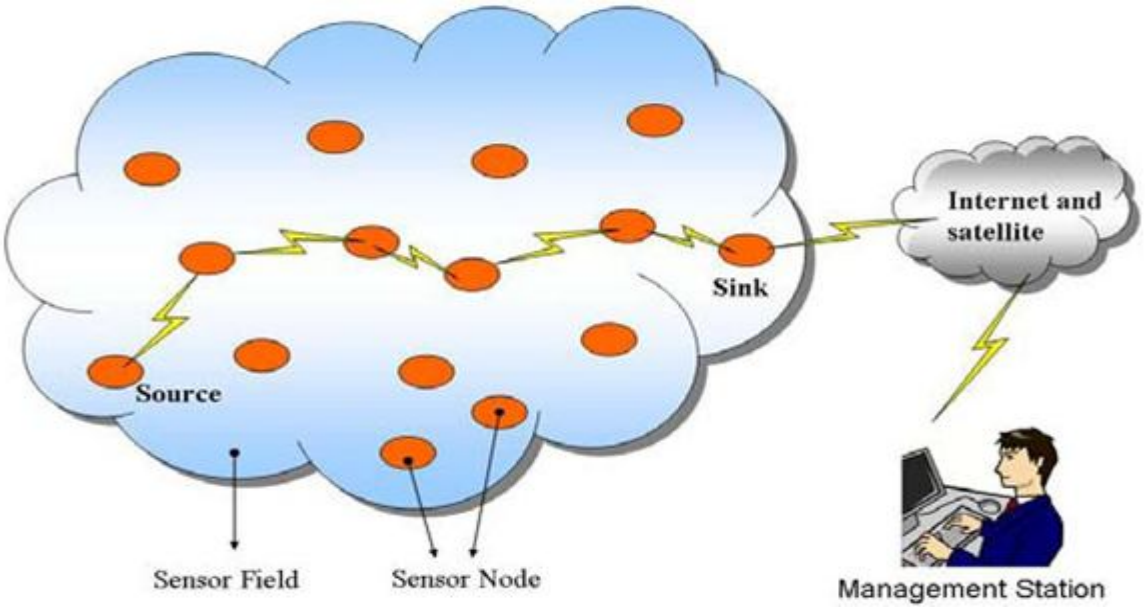

Figure-1.1 Communication Architecture of WSN

Sensor computing is limited by extremely constrained resources, such as storage, computation capability, radio model and energy. These limitations affect the types of routing mechanisms that can be efficiently deployed. Sensor nodes are generally powered by batteries, and these are often very difficult to change or recharge in inaccessible terrains. The power consumption in wireless sensor computing can be categorized into two parts, *i.e.*, communication and computation. Among these, communication consumes the most power. Hence, reducing the number of unnecessary transmissions is the best way to save energy consumption and prolong the lifetime of the sensor service network.

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1.1. Wireless Sensor Network (WSN)

"A sensor network comprises many sensor nodes, which are randomly deployed in inaccessible areas around a phenomenon without predetermination." or "A sensor network is a set of small autonomous systems , called sensor nodes which cooperate to solve at least one common application. Their tasks include some kind of perception of physical parameters".

A sensor node consists of four basic components namely sensing unit, processing unit, transceiver unit and power unit. Figure 1.2 Illustrate the Sensor Node Hardware. The sensing units usually comprise two subunits, namely sensors and analog-to-digital converters (ADCs). The analog signals produced by the sensors are converted into digital signals by the ADC, and then fed into the processing unit. The processing unit, which is generally linked with a small storage unit including ROM and RAM, manages the procedures to execute the assigned jobs.

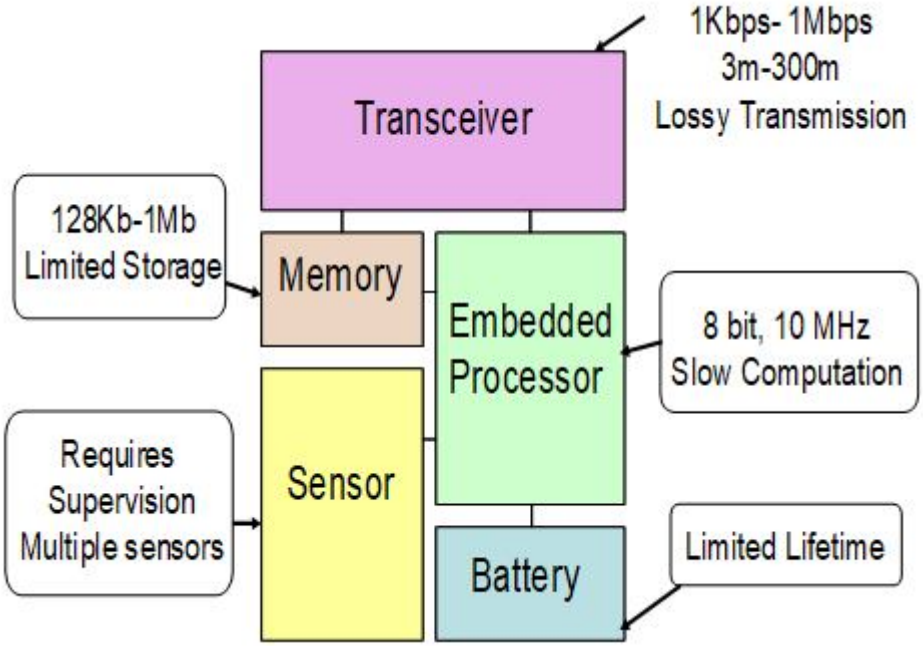

Figure-1.2: Sensor Node Hardware

A transceiver unit connects the node to the network, and communicates with other nodes. One of the most important components of a sensor node is the power unit. Power units may be only supported by batteries, or by solar cells that act like a power generator without recharging. Moreover, some other application-dependent components may be attached. A mobilize is needed when the sensor nodes need to move to carry out the assigned jobs. Advances in hardware technology mean that nodes, including all subunits are now smaller matchboxes device. Some additional stringent constraints for sensor nodes are low power consumption, operation in high dense sensor network, low production cost and adaptation to the environment.

1.2 Routing Protocol for WSN

Routing is elementary in all wireless sensor networks. The main task of such a routing algorithm is to maintain data flow from the source to destination sensor nodes, maximize network performance, and build routing tables one for each sensor node in the network, which helps incoming data packets to choose any efficient outgoing link to continue their travel towards the destination node.Existing routing protocols that are not designed for wireless sensor networks show poor performance when implemented in sensor networks. Ant inspired intelligent algorithms show promising results in solving routing problems in sensor network. By using ants, bees and other social swarms as models, software agents can be created that can solve complex problems, such as rerouting of traffic in a busy telecommunication network. Swarm intelligence, which is revealed by such natural biological swarms, has various great properties popular in many engineering systems, for instance in network routing. Swarm intelligence systems refer to complex behaviors, typically invented from some simple agents cooperating with one another and with their environment.

One of the most successful swarm intelligence techniques is called Ant Colony Optimization (ACO). ACO is an optimization algorithm that can be used to find approximate solutions to difficult combinatorial optimization problems. In ACO artificial ants find solutions by moving on the problem graph and imitating real ants. They leave artificial pheromones on the graph in such a way that future artificial ants can find better solutions. ACO

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has been successfully applied to a remarkable number of optimization problems. Ants use reinforcement learning to discover the best way. In reinforcement learning, the intelligent system is just given a goal to reach. The system then adopts the goal by a trial and error interaction with the environment. For the interactions that take the system close to the target, a positive reward is received while going away from the target, a negative reward is assigned. Computer scientists have addressed the reinforcement learning of an artificial system by introducing a concept called pheromone decay. When the chemical evaporates rapidly, longer paths will have trouble maintaining stable pheromone trails. This has been used for telecommunication networks. Artificial ants continuously explore different paths, and pheromone trails to provide backup plans. Thus, if one link breaks down, a pool of alternatives already exists .Wireless Sensor Network Routing Algorithms based on ACO presented in last few years are .

BASIC ANT ROUTING ALGORITHM

Basic ant Routing Algorithm is not optimized for routing in wireless sensor network but it works as a foundation for many ACO based routing algorithms.

Informally, the basic ant routing can be described as follows [6]:

- At some intervals, which may vary with time, a forward ant is launched from the source node toward the destination node.
- Each forward ant searches for the destination by selecting the next hop node according to the link probability distribution. Initially all the links have equal probability.
- While moving forward, each forward ant remembers the list of nodes it has visited and tries to avoid traversing the same node.
- Once a forward ant _nds the destination, a backward ant is created, which moves back along the links that the forward ant had traversed.
- During the backward travel, the cost from the destination to each node in the path is recorded; rewards are then given according to the relative goodness of the path. Probabilities of the nodes in the path are updated according to the rewards.
- Once a backward ant arrives at the source, the next launch interval is calculated according to the relative goodness of the whole path. Zhang et al. [6] proposed three ant-routing algorithms for sensor networks:

E and D ants

This approach is developed to minimize the time delay in transferring a fixed number of data packets for the sake of the energy constrained [9]. In this study, a novel Energy x Delay model based on ant algorithms is proposed and called “E and D ants” for short. The lifetime maximization of the network and real-time data transmission services are the main features of the developed algorithm. E and D ants algorithm is compared to other ant-based routing algorithms like ‘antnet and ant-chain’ about the issues of routing information, routing overhead and adaptation, and as such, simulation experiments are done in OPNET. Results show that E and D ants algorithm outperforms ant-net and ant-chain about seven times better.

II. LITERATURE SURVEY

2.1 Overview of Ant Routing in WSN

Ant colony algorithms were first proposed by Dorigo et al as a multi-agent approach to difficult combinatorial optimization problems like the traveling salesman problem (TSP) and the quadratic assignment problem (QAP), and later introduced the ACO meta-heuristic.

There are two types of ants applied in the algorithms, forward ants and backward ants. Forward ants, whose main actions are exploring the path and collecting the information from the source nodes to destination node, have the same number as the source nodes. The paths that forward ants travel will construct a tree when they merge into each other or reach the destination and data is transmitted along the tree paths. There are two key factors that conduct the movement of the forward ants: one is pheromone trails that are deposited along the edges, and the other is the nodes potential which provides an estimate of how far an ant will have to travel from any the node to either reach the destination d or to aggregate data with another node. While the backward ants, traveling back from destination node to source nodes contrary to the forward ants, perform their uppermost function of updating the information of their pass-by nodes. ACO algorithms are a class of constructive meta-heuristic algorithms that mimic the cooperative behavior of real ants to achieve complex computations and have been proven to be very efficient to many different discrete optimization problems. Many theoretical analyses

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related to ACO show that this optimization can converge to the global optima with non-zero probability in the solution space and their performance have greatly matched many well-studied stochastic optimization algorithms, for example, genetic algorithm, pattern search, GPASP, and annealing simulations.

2.2. Related Research

Sanjoy Das et al have given an on-line ACO algorithm using AntNet techniques for MSDC [11] which has been formalized to be a typically Minimum Steiner Tree problems. Improved algorithm proposed by adding another type of ants, random ants, just like the newspaper deliverer, whose main task is to dissipate information gathered at the nodes among other neighboring nodes. Simulation results also show that their algorithms are significantly better than address-centric routing. In these proposed algorithms the forward ants normally spend a long time. There is a bug of dead lock in their algorithms. In their improved algorithm, a large amount of random ants are needed. In [5] the authors propose a new idea of keeping the information by all sensor nodes of their own. By this even in the absence of global processing the nodes still can work on their own information. In this research still have a drawback of broadcasting while initialization phase which consumes lot of energy at the beginning of the network deployment. Zhang et al. [6] proposed three ant-routing algorithms for sensor networks. The SC algorithm is energy efficient but suffers from a low success rate. The FF algorithm has shorter time delays; however, the algorithm creates a significant amount of traffic. Despite high success rate shown by the FP algorithm that it is not energy efficient.

An Adaptive ant-based Dynamic Routing (ADR) algorithm using a novel variation of reinforcement learning was proposed by Lu et al. [7]. The authors used a delay parameter in the queues to estimate reinforcement learning factor. In [12] proposed a novel approach for WSN routing operations. Through this approach the network life time is maintained in maximum while discovering the shortest paths from the source nodes to the base node using an evolutionary optimization technique. The research has also been implemented on microchip PIC® series hardware, called PIC12F683. In [8] propose two adaptive routing algorithms based on ant colony algorithm, the Adaptive Routing (AR) algorithm and the Improved Adaptive Routing (IAR) algorithm. To check the suitability of ADR algorithm in the case of sensor networks, they modified the ADR algorithm (removing the queue parameters) and used their reinforcement learning concept and named it the AR algorithm. The AR algorithm did not result in optimum solution. In IAR algorithm by adding a coefficient, the cost between the neighbor node and the destination node, they further improve the AR algorithm. [9] proposed a dynamic adaptive ant algorithm (E&D ANTS) based on Energy and Delay metrics for routing operations. Their main goal is to maintain network lifetime in maximum and propagation delay in minimum by using a novel variation of reinforcement learning (RL). E&D ANTS results was evaluated with AntNet and AntChain schemes.

2.2 Comparison of the most recent ANT based Routing in WSN

Comparison of the most recent ANT based routing in WSN: SC and Okdem [12] depend on the energy metric while FF based on delay. IA and IAR is the modification of ADR which used a delay parameter in the queues to estimate reinforcement learning factor. In FP they combine the forward ant and data ant to enhance the success rate. E&D ANT based on energy and delay metrics for routing operations.

In our proposed algorithm, the best values of velocity, PRR and remaining power mechanism [13] are used to select forwarding node because velocity alone does not provide the information about link quality. The best link quality usually provides low packet loss and energy efficient [14]. Another novel feature of proposed algorithm is, it utilizes the remaining power parameter to select the forwarding candidate node. The remaining power assists the source node or intermediate node to distribute the forwarding load to all available forwarding candidates and hence avoid the routing holes problem.

2.3 Proposed Work

This project aims to create the new mechanism that can maintain the features of wireless sensor networks (WSNs) such as multihop routing and dynamically environmental changes in a complete autonomous mode. In order to address autonomous capability for multihop WSNs, it has been visualize that self-organized network application can understand the network operational objectives. Additionally, probabilistic methods that provide scalability and preventability can be found in nature and adapted to technology. For achieving above mentioned objective this project consist of design and implementation of the ant based autonomous routing algorithm for sensor networks which consist of three modules,

III ANALYSIS

3.1 Analysis of ACO Approach

Many algorithms inspired by the foraging behavior of ant colonies have been applied to the solution of difficult discrete optimization problems. A generic routing problem in communication networks is one of them. Routing

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operation in WSNs is similar to classical routing techniques. However, there are several constraints that must be considered in a WSN structure. The major constraint is the status of energy levels of the nodes involved in a routing task. This thesis considers this constraint as a heuristic value based on energy.

In ACO based approach, each ant tries to find a path in the network, providing minimum cost. Ants are launched from a source node *s* and move towards destination node *d*, hopping from one node to the next. Ant *k* in node *i* choose the next node *j* to move to, according to a probabilistic decision rule (equation 1).

$$p_{ij}^{k}(t) = \begin{cases} \dfrac{[\tau_{ij}(t)]^{\alpha}[\eta_{ij}]^{\beta}}{\sum_{k \in allowed_k}[\tau_{ik}(t)]^{\alpha}[\eta_{ik}]^{\beta}} & \forall\ j \in N_i \ and\ \ j \notin M^k \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

where τ_{ij} is the value of pheromone and η_{ij} is the value of heuristic related to energy. α and β are two parameters that control the relative weight of pheromone trail and heuristic value. In traditional ACO algorithm, each ant has a memory *Mk* that contains the nodes already visited, which enables evasion of the cycling in an ant path. it propose that this information could be used to prevent cycling in a route path. In WSNs, nodes decide if a received data package should be saved into their memory or not, as data transmission is broadcasted to each neighbor. So, a node can make a decision by comparing the package ID and its memory *Mk* whether it has received previously or not. The heuristic value for the node *j* is expressed by equation 2.

$$\eta_{ij} = \frac{e_j}{\sum_{n \in Ni} e_n}$$

where e_j is the energy level of node *j*. This enables an ant to make a decision according to neighbor nodes' energy levels meaning that if a node has a lower energy source then it has lower probability to be chosen.

Algorithm for Processing Backward Ant
Begin
1: if sink is reached then

2: a new backward ant is generated;

3: while the source_node of Forward ant is not reached

4: The backward ant moves along the reverse path of the forward ant followed

Towards the sink node;

5: the backward using (4), (5) to update pheromone value of link *(i,j)*;

7: calculate remaining energy, delay and *Length*;

8: update the remaining energy of *i* and *j*;

9: end-while

10: end-if

End

IV. EXPERIMENTATION AND RESULT

To evaluate the above analysis, OMNeT++ object oriented modular discrete event simulator is used to construct the network topology graph as given in Figure 5.1. The topology is described as a randomly deployed 9-node sensor network. For the Bio-inspired routing algorithm implementation, the program is written in C++ programming language.

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Each link is bidirectional and the weighting value of the link depends on the power consumption (nJ/bit) and ant's moving time delay (ms). After the source nodes produce a quantity of artificial ants or packets conforming to the Poisson distribution, the destination nodes are randomly chosen by average probability. When one packet passes through a node by a certain speed, the node takes the first step to gather all the ant agents into buffer storage and then selects the optimal path from its routing table to transfer packets. In this way all the ants disperse in as many paths as possible to achieve the balance of the load. A fixed size of one packet is considered in our simulation.Initial result through this implementation is the pheromone table on each node is maintained. Pheromone table at each node contains the source node, destination node, delay required to transfer packet to other node, remaining energy of node and pheromone value. Example of pheromone table is shown in Table 4. Table at each node contains the pheromone value for the next node towards the required destination. While the network is online, the routing table is directly built up through pheromone table exponential transformation.

Dest node	Next node	Remaining Energy	Delay	Pheromone Value
1	1	$e_{.}$	$d_{..}$	τ_{11}
1	2	$e_{.}$	$d_{..}$	τ_{12}
1	3	$e_{.}$	$d_{..}$	τ_{13}
….	….	….	….	….
1	N	e	$d_{.}$	τ_{1n}

Table-5.1: Pheromone Table.

Pheromone Table Shows the routing table entries maintained at each node during the simulation, where e is the remaining energy of the next node. $d_{..}$ is delay required to travel link (1,2). τ_{12} is the pheromone value of the link (1,2) Various performance metrics are used for comparing different routing strategies in WSNs.

- Average remaining Energy: The metric gives the average remaining of energy of all nodes during the simulation.
- Delay: The metric gives the time required for each node for transmitting a data packet to sink.
- Number of nodes: The metric gives the number of nodes to be visited while transmitting data packet to sink by each node throughout the simulation time.

V. CONCLUSION

I have proposed an enhanced ant colony inspired self-organized routing mechanism for WSNs. The specified mechanism is based is based on delay, energy and velocity. The adopted factors help WSN in improving the overall data throughput; especially in case of real time traffic while minimizing the energy consumption. The algorithm is also capable to avoid permanent loops which promotes dead lock problem in the running networks.

The dead lock problem is cured by assigning unique sequence ID to every forward ANT and also to backward ANT. Simulation results clearly demonstrate the protocol efficiency and also verify that the protocol is more practicable. Furthermore, this algorithm is also enhanced with reinforcement learning (RL) feature to get superior optimal decision. Finally, this autonomic routing mechanism will come up with better success rate, time and energy consumption.

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A STUDY ON INNOVATIVE TRAINING METHODS TO SUPPORT THE OBJECTIVE OF INDUSTRY 4.0

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ABSTRACT
The term training is often interpreted as "the activity when an expert and a learner engage together to effectively transfer information from the expert to the learner so that the later can better perform a current task or job". Training is to enhance the learner's knowledge, skills or attitudes/ behavior. Training is also defined as, "learning that is provided in order to improve performance on the present job". In the fast changing world the role of training has become a character of tremendous significance. Thus the purpose of training is to bring in the paradigm shift in the performance by effectively applying the contents of training concepts (knowledge, skills or attitudes based) by the trainee. Where as the industry also demonstrating the 4th revolution i.e. Industry 4.0 . First Industrial Revolution is Industry 1.0 that started in 1760s and lasted into 1980s, the production evolved from physical strength to machine power. Increasing in quantity & improving in quality, the machines used steam power. There were three industrial revolution took place that transformed our modern society. With each of these three advancement: the steam engine, the age of science and mass production and the rise of digital technology- the world around us fundamentally changed. And right now, it's happening again, for a fourth time. Here in this study researcher is going to focus on 5 Innovative Training Methods which supports the objectives of Industry 4.0

Keywords: AMT- Advance manufacturing technology, CPPS- cyber-physical production system, IoT-Internet of Things, TNA-Training Need Analysis, TDC- Training & Development Center

BENEFITS OF TRAINING
There are several other reasons besides listed above that are beneficial resulting out of training. A few are stated below

- Increased job satisfaction and morale among employees;
- Elevated employee motivational level;
- Improved efficiencies in process, resulting in financial gains;
- Increased capacity to adopt new technologies and methods – change;
- Reduced employee turnover;
- Increased innovation in strategies and products;
- Enhanced company image;
- Concept of Social Engineering;
- Diversified approach – Effective Risk Management.

TRAINING PROCESS
Before going further, let us discuss training process described on the next page. The diagram has been adopted from "Performance Matters" –founded by Robert S Drake, Jr. and Dawn Drake. Training process described in the diagram seems to be quite systematic and useful.

The blue ovals at the top of the diagram represent key steps in the Strategic Business Planning Process. This process to be completed before development of the training plan. The green ovals on the diagram illustrate the Strategic Training Process – performing these assessment and planning tasks enables developing creative training and educational solutions that will produce measurable improvement in peoples' performance. The rust-colored ovals represent the Tactical Training Process – actual implementation of the training that includes evaluation of the training as a whole.

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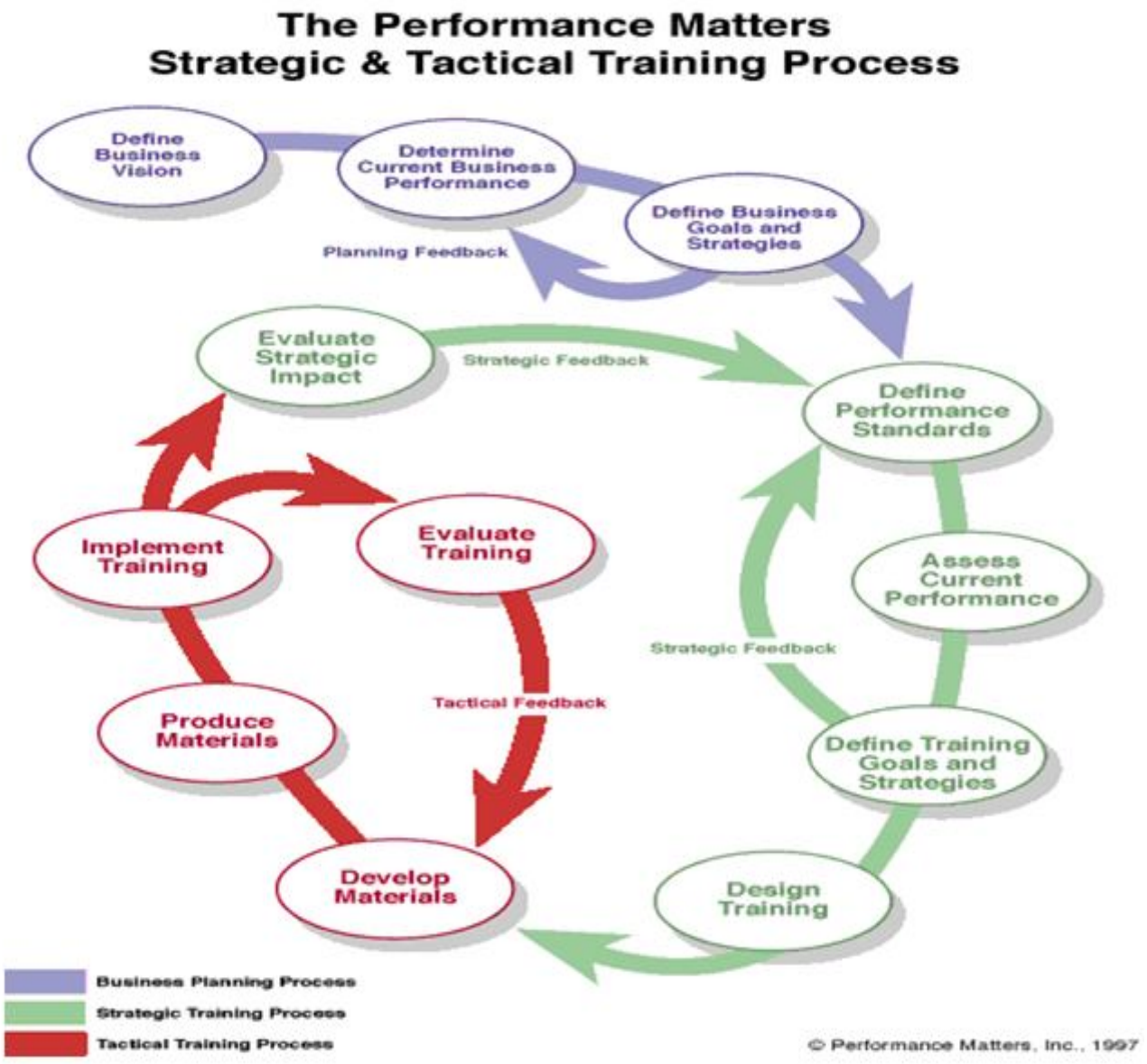

CHARACTERISTICS OF EFFECTIVE TRAINING

Training thus far has been described as a systematic approach to development and bridging the gap between the idealistic and realistic situations – targets fixed and targets achieved. There is, therefore, certain sequence of steps to be exercised to make the training process effective and purposeful. Following are the main characteristics of effective training.

- Identification of Training Needs
- Design of Training Module
- Sponsoring of Trainees
- specifying the Training Method
- Conduct of Training

OBJECTIVES OF INDUSTRY 4.0

- To optimize and scale.
- To replace humans but eventually humans have to learn new tricks.
- To make Internet as the main amplifier for revolution and innovation.

LITERATURE REVIEW

Keeping in view the whole range of activities, and also to maintain a high degree of professionalism, the need for enhancing training effectiveness is doubly important to meet the objective of Indutry Revolution.

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Identification of Training Needs: The actual conduct of training programme is always need based. Therefore, proper identification of the training needs is vital. In this process, certain basic parameters should be kept in view:

(a) Organizational analysis –

(b) Job analysis –

(c) Task analysis –

1. **Training Orientation**: Proper identification of training needs enables us to decide about the orientation of training i.e. the acronym 'ASK' or 'KSA' plays an important role where
   - '**A**' stands for attitude
   - '**S**' stands for skills i.e. technical/ operational procedures, techniques etc. ; and
   - '**K**' stands for knowledge i.e. concepts, fundamentals, regulations etc.
2. Level of Participants:
3. Selection Process:
4. Designing and Conduct of Training:
5. Training Methodology:
6. Training Evaluation
7. Training Faculty

NEED FOR STUDY

The global industry 4.0 market is prognosticated to be benefited with the swelling focus on production cost and efficiency and the surging adoption of industrial internet. With the increasing demand for efficiency, flexible, and faster production and the rise of digital business models, there could be scores of reliable prospects taking birth in the market. The world industry 4.0 market is anticipated to gain a sound momentum in its growth because of the support obtained from the digitalization and interconnection of various products and services. This growth driver of the market could make a contribution of another 2.0% to 3.0% to the annual revenue earned by ensuring strong competitiveness. Being anintegral part the human resource must be trained so they can in tune with this Industry revolution,

Recent years have seen a growing concern about the adaptability and willingness of the Indian industrial worker to cope with radical technological changes such as the introduction of Advanced Manufacturing Technologies. Adding to the concern is the indispensability of these technologies in meeting global competition. A study of workers in the Indian Industry shows that while the workers have a significantly positive attitude towards the introduction of new technologies like AMT, they are apprehensive about organisational issues, for example management's objective behind change, skill redundancy and access to information to facilitate technology management..

OBJECTIVES OF THE STUDY

- To identify systematic means in the process of Training Needs Analysis;
- To Identify the innovative training methodolody which support the objective of Industry 4.0
- To adhere to effective implementation of Training Interventions including the design and the conduct of training;
- To Suggest most Modern and practicable steps for enhancing Training Effectiveness.

One key factor in employee motivation and retention is the opportunity that employees want to continue to grow and develop job and career enhancing skills. In fact, this opportunity to continue to grow and develop through training and development is one of the most important factors in employee motivation.

This study will largely focus towards discovering and exploring the secrets about what employees want from training and development opportunities, however. Also training and development opportunities are not just found in internal/external training classes and seminars. The study will emphasize what employees want in training and development opportunities.

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SCOPE OF THE STUDY

Like a typical manufacturing industry set up, the training courses/ programs are designed and conducted/ organized by the training departments. The onus of selection process – determining performance gap, doing job analysis, identifying training needs/ carrying out training needs analysis etc and post training exercise – assessing transfer of learning and summative evaluation of a training program or working out return on investment on training rests with the sponsoring department. Training and development center (**TDC**) are involved only for designing and conducting training programs. But as a matter of success or failure of training TDC are only held responsible which should not be the case.

The scope of the research would be restricted to functional boundaries of the industry itself therefore, has been conducted at their Training & Development Centres, and the relevant data has been collected from their offices.

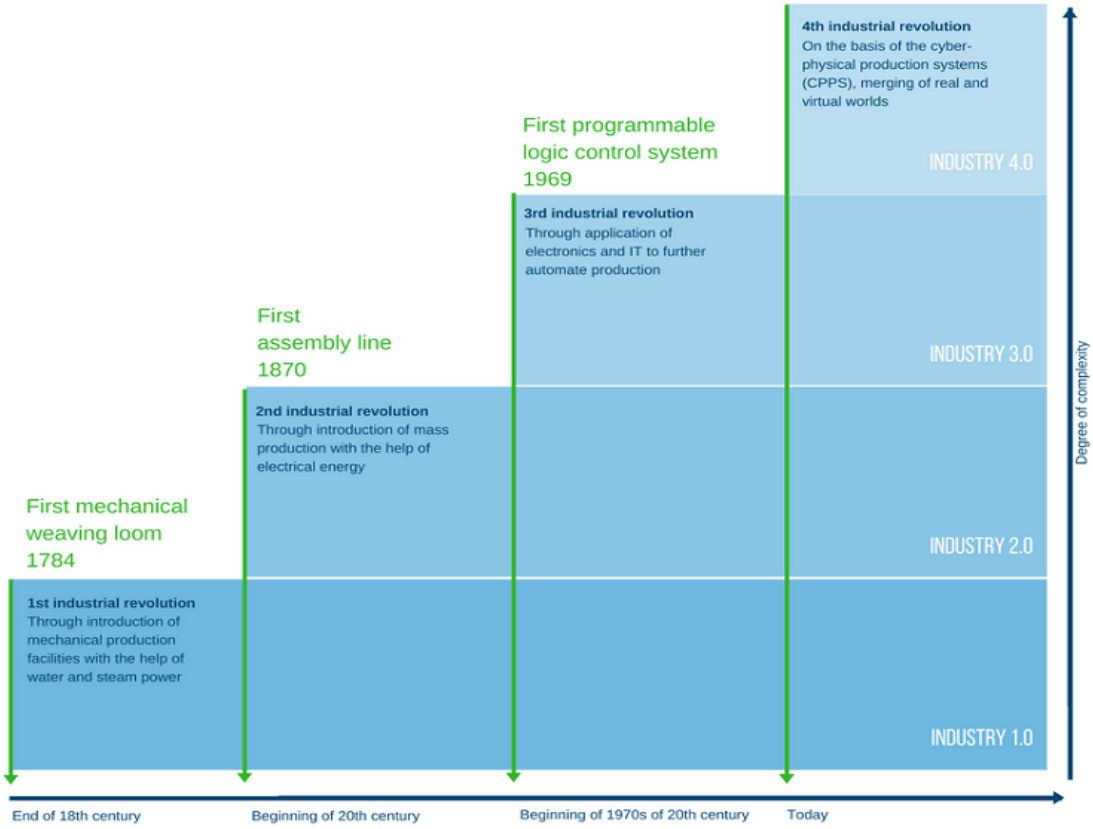
LIMITATIONS

The study will focus on largely the training programs pertaining to Technical, Non Technical, Administration & Establishment, Interpersonal training, Management related programmes etc. Selection of the courses will, however, be made during the course of research itself. Again, selection of the courses for research will be made in such a manner that all the categories of employees e.g. Level 1 to 10, from different department are covered for study, attending different types of courses in different Training & Development Centres, Pune.

ANALYSIS AND DISCUSSION

In Current study Researcher will be focusing on the selected Innovative Training Methods and its benefits in support towards objective of Industry 4.0 objectives:

To be able to understand how Industry 4.0 became today's buzzword, a look at its predecessors might give us a perspective on how this revolution in particular is different. The following diagram shows a timeline of the evolution of manufacturing and the industrial sector in general (Source: Deloitte).



The fourth industrial revolution takes the automation of manufacturing processes to a new level by introducing customized and flexible mass production technologies.

This means that machines will operate independently, or cooperate with humans in creating a customer-oriented production field that constantly works on maintaining itself. The machine rather becomes an independent entity that is able to collect data, analyze it, and advise upon it.

This becomes possible by introducing self-optimization, self-cognition, and self-customization into the industry. The manufacturers will be able to communicate with computers rather than operate them.

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HOW WILL MACHINES COMMUNICATE

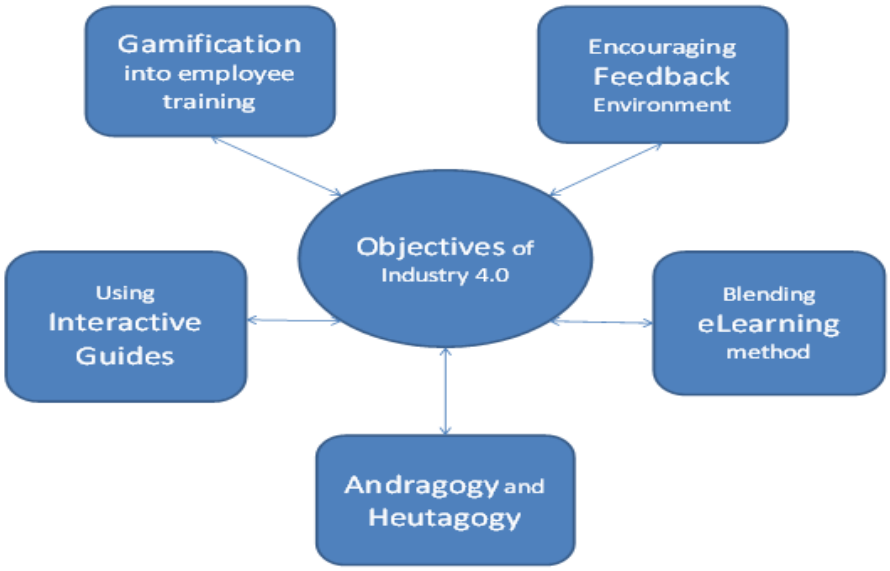
The rapid changes in the information and communication technologies (ICT) have broken the boundaries between virtual reality and the real world. The idea behind Industry 4.0 is to create a social network where machines can communicate with each other, called the Internet of Things (IoT) and with people, called the Internet of People (IoP).

This way, machines can communicate with each other and with the manufacturers to create what we now call a cyber-physical production system (CPPS). All of this helps industries integrate the real world into a virtual one and enable machines to collect live data, analyze them, and even make decisions based upon them.

HOW TRAINING PLAYS IMPORTANT ROLE IN INDUSTRY 4.0

Organization in Industry 4.0 need to design their training program in way which can enhance the innovative capability and learning . Organizations should offer different type of Training to the employees to enable them multitasking. It is not necessary that these training should be directly relevant to the employee job but to increase the variety of skills, such training sessions to be ongoing. Training should also focus on team building and team work skills and mentoring should be routine activity of manager. Training sessions should focus on enhancing problem solving skills of employee.

Let's discuss in detail- the following Innovative Training Methods which can support the objective of Industry 4.0 through the skilled employees.



1. Integrate elements of Gamification into employee training

The most effective onboarding process is one that gets employee excited!!

Make Sure your employees are actively engaged from day one with gamified elements strategically scattered throughout the entire staff training process. Gaming for learning combines element of fun, with instructional design, to create a training platform that hold an employee's attention and motivate them to actually finish a course. By not letting employees progress until they complete the task. For example: gamification makes training entertaining with challenges and competition. Task can be basic one like "complete tax documentation or more involved like "making 10 cold calls" Each task plays an integral role in the employee onboarding experience. And each element that can be "gamified" to elicit continued motivation.After the employee completes each task, send out a congratulation email.

Gamification in Employee training let new hires make a mistake and then figure out the optimal strategies and solutions, that too without pressure of perfection in performance.

This way Gmification play important role in employee training by making them more confident.

2. Encourage a high feed back environment

Another method of effective training can be encouraging a high feedback environment, Whether you plan to onboard employees through online coreses, group project, or individual training, makes feedback an essential step of each staff training session. Not only will this require employees to participate more actively in their onboarding process role, but it will build the foundation for relationship they form with their task and with the organization.

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When a new employee joins a 'cell' they are immediately given responsibility, freedom of expression and are encouraged to give feedback. Employee training may involve other eLearning methods but this aspect of continuous feedback is important for creating empowered work force. If an organization succeeded in creating such work force this automatically lead to achieve the objectives of 4th Industry revolution. Not only it is important that employees offer feedback throughout training session, itscrucial that you should provide feedback through entire session too. Feedback is a tool for continued learning, offering constructive criticism at critical points throughout the employee training will strengthen the company goal alignment, improve relationships, and enhance product and service improvements too. So leaning through employee feedback is key to employees' expertise and company's growth.

3. Blending eLearning method for employee training

Blending eLearning can deliver the right mix of massive open online courses, instructor led training and gamification to build program that match training strategies that meet your employees' needs. The phrase "blending learning" is often used to describe the way companies approach eLearning by combining traditiona classroom methods with independent study, here a trainer can create hybrid teaching method with independent study, you can create a hybrid teaching method better suited to meet the unique needs of your employee base. Organization can achieve extra efficiency from the employees who study their own faster pace.

4. Andragogy and Heutagogy

An important change took place in 1970 where , in the way in which educational experiences for adults has been designed. The approach, known as andragogy, contrasts quite sharply with pedagogy which is the teaching of children, moving from andragogy towards truly self-determined learning. The concept of truly self-determined learning, called heutagogy, builds on humanistic theory and approaches to learning described in the 1950s. It is suggested that heutagogy is appropriate to the needs of learners in the twenty-first century, particularly in the development of individual capability.

Heutagogy, a form of self-determined learning with practices and principles rooted in andragogy, has recently resurfaced as a learning approach after a decade of limited attention. In a heutagogical approach to teaching and learning, learners are highly autonomous and self-determined and emphasis is placed on development of learner capacity and capability with the goal of producing learners who are well-prepared for the complexities of today's workplace. The approach has been proposed as a theory for applying to emerging technologies in distance education and for guiding distance education practice and the ways in which distance educators develop and deliver instruction using newer technologies such as social media. The renewed interest in heutagogy is partially due to the ubiquitousness of Web 2.0, and the affordances provided by the technology.

5. Using Interactive guides for employee training

Interactive guides are the newest technology enhancing human resource efforts and employee training industry. Proven to increase employee engagement, knowledge retention and software adoption, any professional positioned in the eLearning landscape should experiment with interactive guides as form of staff training. Interactive guides are divided into chapters and superimposed directly on any kind of application. This way, employees can be automatically get trained within the software itself. After completing the interactive guides, both new and existing employees have power to recall or request specific walkthrough to perform operations they are not familiar with.This is because of virtual assistant which remains present in the system. Employees can always revisit trainings if they don't know how to perform a specific task in the software, thus eliminating a learning curve and the need for retraining.

Administrators can also make the interactive software guides mandatory, granting conditional access to chapters only after preliminary task are completed. This way, companies can create unique employee training programs on their software solution. Company can now onboard employees for software adoption or product expertise with simple, step by step, interactive guides. The employee is kept productive s they engage with software and system. They aren't working within foreign platform(like video tutorials), but within the actual platform they're being trained.

Digitisation has an impact on all organisations including small and medium entreprises (SMEs) across various sectors or industries. In each case, the impact is a different one which makes it essential for companies to have a good understanding and view of what they face and how digitisation will affect their company: which opportunities can be seized and which threats have to be faced?

The impact of digital disruption has to be managed alongside the more general volatile, unpredictable, complex and ambiguous (VUCA) operating conditions of recent years.

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Leaders are facing the almost overwhelming task of restoring confidence and respect in leadership and business. They are being called upon to guide organisations through times of turbulence and uncertainty, to show the way forward and to set an example. And all this in the face of an increasingly disruptive global economy and in a climate of cynicism and mistrust – tough economic and political circumstances by any standards.

We believe that leadership in the digital world is all about the ability to impact and influence your followers and stakeholders towards achieving the mission and objectives of the organisation by demonstrating effectively the suite of next-generation leadership competencies such as cognitive readiness skills, critical thinking and emotional and social intelligence competencies including empathy and relationship management

The Fourth Industrial Revolution or Industry 4.0 as it is commonly known, represents the combination of cyber-physical systems, the Internet of Things, and the Internet of Systems. In short, it is the idea of smart factories in which machines are augmented with web connectivity and connected to a system that can visualise the entire production chain and make decisions on its own.

In this fourth revolution, a range of new technologies will evolve that combine the physical, digital and biological worlds. These new technologies will impact all disciplines, economies, and industries, and even challenge our ideas about what it means to be human.

Technological innovation is on the brink of fuelling momentous change throughout the global economy, generating great benefits and challenges, in equal measure. To thrive in this environment, Schwab argues, public-private research collaborations should increase, and should be structured towards building knowledge and human capital to the benefit of all.

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FUTURE OF THE INTERNET

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ABSTRACT
Internet world as we know it today has undergone far-reaching and profound changes since its early days while becoming a critical communications infrastructure underpinning our economic performance and social welfare. With an estimate of 1.1 billion users world-wide today the Internet is poised to become a fully pervasive infrastructure providing anywhere, anytime connectivity. Thanks in particular to the further deployment of wireless technologies, the number of users of the Internet is expected to jump to some 4 billion in a matter of few years. This event will try to provide some answers to the challenges arising from the emerging new technologies and societal issues related to the Future Internet.

Keyword: Internet, Future of the Internet

INTRODUCTION
The first internet boom, a decade and a half ago, resembled a religious movement. Omnipresent cyber-gurus, often framed by colorful PowerPoint presentations reminiscent of stained glass, prophesied a digital paradise in which not only would commerce be frictionless and growth exponential, but democracy would be direct and the nation-state would no longer exist. One, John-Perry Barlow, even penned "A Declaration of the Independence of Cyberspace".

There are now 2.3 billion internet users worldwide, which is nearly a third of the world's population and that number is growing at 8% per year. But what's more startling is there are now 1.1 billion 3G mobile subscribers and that they are increasing at 37% per year. What's significant about that? Two things: first it means that already a significant proportion of the world's population is accessing the internet via a mobile phone rather than via a fixed-line connection. Second, smartphones currently account for less than a fifth of all the mobile phones in the world – which means that the market for internet-enabled phones has a lot of room for further growth.

Even though all this sounded Utopian when it was preached, it reflected online reality pretty accurately. The internet was a wide-open space, a new frontier. For the first time, anyone could communicate electronically with anyone else—globally and essentially free of charge. Anyone was able to create a website or an online shop, which could be reached from anywhere in the world using a simple piece of software called a browser, without asking anyone else for permission. The control of information, opinion and commerce by governments—or big companies, for that matter—indeed appeared to be a thing of the past. "You have no sovereignty where we gather," Mr Barlow wrote.

The lofty discourse on "cyberspace" has long changed. Even the term now sounds passé. Today another overused celestial metaphor holds sway: the "cloud" is code for all kinds of digital services generated in warehouses packed with computers, called data centers, and distributed over the internet. Most of the talk, though, concerns more earthly matters: privacy, antitrust, Google's woes in China, mobile applications, green information technology (IT). Only Apple's latest Some things seem to inspire religious fervour, as they did again this week.

OBJECTIVES OF THE STUDY
- **Primary Objectives**
  - To find out the current user on the internet.
  - To understand the current market for internet.
  - To find out new technology which are used in internet.
- **Secondary Objectives**
  - To study the impact of Internet on the world.
  - To study the effectiveness of Internet towards the users.

STATEMENT OF THE PROBLEM
There are too many studies that have been done to find out the future of the Internet. This study investigates the factors that enhance the effectiveness of Internet in todays .

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SOURCE OF DATA

Primary data was collected by using a structured questionnaire. This was administered by the respondents. The total sample size taken was 20respondents. These samples were chosen by a random sampling method.

Secondary data was also used for collection of data. The data was collected from various sources like newspapers, research papers and internet.

FINDINGS

There are various findings derived by analyzing the primary and secondary data. Some of the findings derived after analyzing primary data are:

Table No-1: Table showing the growth of Internet usage among all over the world

DATE	NUMBER OF USERS	% WORLD POPULATION	INFORMATION SOURCE
December, 1995	16 millions	0.4 %	IDC
December, 1996	36 millions	0.9 %	IDC
December, 1997	70 millions	1.7 %	IDC
December, 1998	147 millions	3.6 %	C.I. Almanac
December, 1999	248 millions	4.1 %	Nua Ltd.
March, 2000	304 millions	5.0 %	Nua Ltd.
July, 2000	359 millions	5.9 %	Nua Ltd.
December, 2000	361 millions	5.8 %	Internet World Stats
March, 2001	458 millions	7.6 %	Nua Ltd.
June, 2001	479 millions	7.9 %	Nua Ltd.
August, 2001	513 millions	8.6 %	Nua Ltd.
April, 2002	558 millions	8.6 %	Internet World Stats
July, 2002	569 millions	9.1 %	Internet World Stats
September, 2002	587 millions	9.4 %	Internet World Stats
March, 2003	608 millions	9.7 %	Internet World Stats
September, 2003	677 millions	10.6 %	Internet World Stats
October, 2003	682 millions	10.7 %	Internet World Stats
December, 2003	719 millions	11.1 %	Internet World Stats
February, 2004	745 millions	11.5 %	Internet World Stats
May, 2004	757 millions	11.7 %	Internet World Stats
October, 2004	812 millions	12.7 %	Internet World Stats
December, 2004	817 millions	12.7 %	Internet World Stats
March, 2005	888 millions	13.9 %	Internet World Stats
June, 2005	938 millions	14.6 %	Internet World Stats
September, 2005	957 millions	14.9 %	Internet World Stats
November, 2005	972 millions	15.2 %	Internet World Stats
December, 2005	1,018 millions	15.7 %	Internet World Stats
March, 2006	1,023 millions	15.7 %	Internet World Stats

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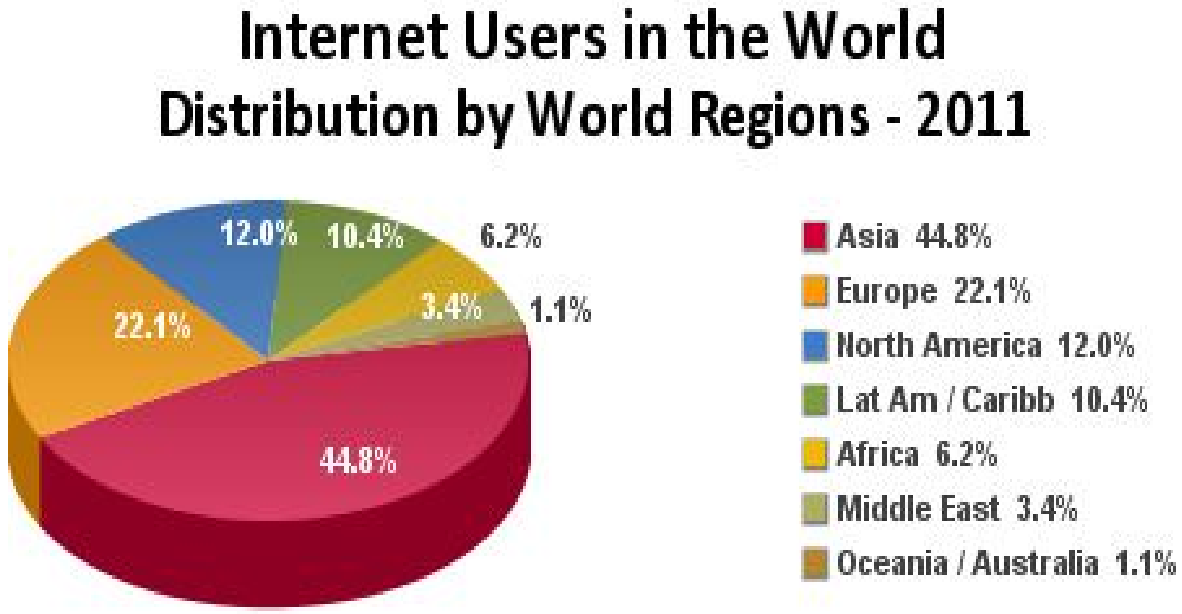
June, 2006	1,043 millions	16.0 %	Internet World Stats
Sept, 2006	1,086 millions	16.7 %	Internet World Stats
Dec, 2006	1,093 millions	16.7 %	Internet World Stats
Mar, 2007	1,129 millions	17.2 %	Internet World Stats
June, 2007	1,173 millions	17.8 %	Internet World Stats
Sept, 2007	1,245 millions	18.9 %	Internet World Stats
Dec, 2007	1,319 millions	20.0 %	Internet World Stats
Mar, 2008	1,407 millions	21.1 %	Internet World Stats
June, 2008	1,463 millions	21.9 %	Internet World Stats
Sept, 2008	1,504 millions	22.5 %	Internet World Stats
Dec, 2008	1,574 millions	23.5 %	Internet World Stats
Mar, 2009	1,596 millions	23.8 %	Internet World Stats
June, 2009	1,669 millions	24.7 %	Internet World Stats
Sept, 2009	1,734 millions	25.6 %	Internet World Stats
Dec, 2009	1,802 millions	26.6 %	Internet World Stats
June, 2010	1,966 millions	28.7 %	Internet World Stats
Sept, 2010	1,971 millions	28.8 %	Internet World Stats
Mar, 2011	2,095 millions	30.2 %	Internet World Stats
Jun, 2011	2,110 millions	30.4 %	Internet World Stats
Sept, 2011	2,180 millions	31.5 %	Internet World Stats
Dec, 2011	2,267 millions	32.7 %	Internet World Stats
Mar, 2012	2,280 millions	32.7 %	Internet World Stats
June, 2012	**2,336 millions**	**33.3 %**	Internet World Stats

Graph No-1: Graph showing the Internet users all over the world region



Source: Secondary Data

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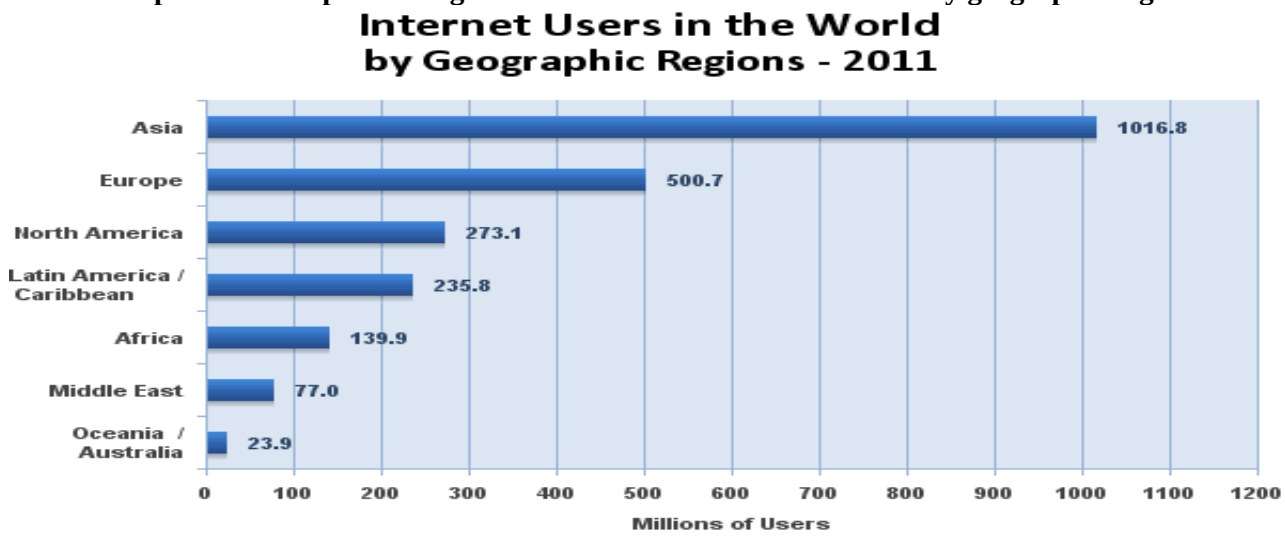
Graph No-2: Graph showing the Internet users all over the world by geographic region



Source: Secondary Data

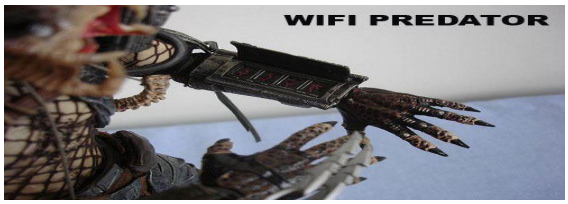
6 PREDICTIONS FOR THE FUTURE OF THE INTERNET :

1) Audio web surfing

Building the web with standards and accessibility in mind brings the Internet to as wide an audience as possible. With the importance of accessibility getting the recognition it deserves lately, I think screen readers will soon take a front seat as a common means for surfing a site for a much broader audience.

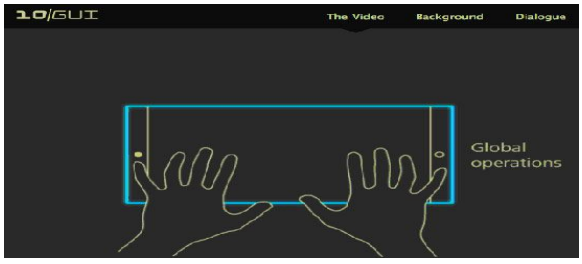
2) Web surf on any device

It seems the tech industry is eager to integrate the Internet into every device these days. It's the equivalent to adding a digital clock to a coffee maker. Why not? Adding a touch-screen to your fridge and other appliances might create new opportunities and challenges for interfacing.



3) Input revisited

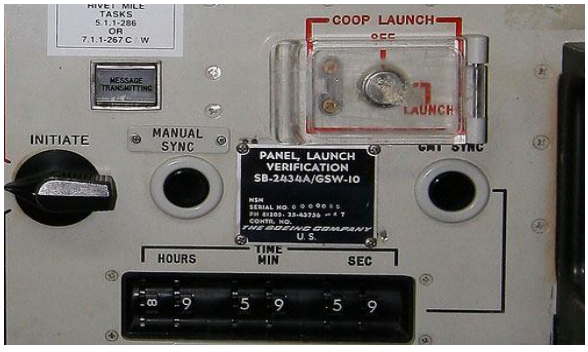
The recent boom in smartphone devices has shown us that tiny screens and suddenly awkward digits can sometimes make for a cumbersome user experience. Our traditional concepts of input applied to the next generation could be confounded more as the devices and environments change. At 6′ 4", I don't relish the idea of hunching over a wall-mounted screen that has my 5′ 2" coworker in mind.



4) Mobile networking

Bluetooth is known for allowing wireless communication, like with hands-free systems in cars, and the some of the latest mice and keyboards (like the aforementioned Magic Mouse). It also may be the future for mobile networking and P2P interactions. Check out this Android 2.0 "Pong" demonstration:

Does that blow your mind? Imagine interacting on a website with a friend, or with the advertisement at the bus shelter. The possibilities become staggering.



5) The end of .com domination

For as long as the Internet has been around, *.com* has been the assumed default extension for websites (regardless of whether or not the site was "commercial" or not). For a while, there was almost a negative stigma to not having the .com for your brand, company or personal site. How many times has traffic meant for your site ended up at the .com equivalent?

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6) IE6 stops being used

I'll admit this seems like the *most unlikely* out of all the other predictions. Maybe it won't happen in our lifetime, but it is somehow feasible that it could happen.

Here's how it could go down: in the distant future, some impending disaster will cause mankind to have to abandon Earth and head for a planet light years away. The question of who and what can go to the new planet will of course be a major issue, and sadly IE6 won't make it off of the doomed Earth. The escaping web designers and developers will enjoy a short-lived period of joy as there will always be some misfit version of Internet Explorer to support.

CONCLUSION

Goal of this study is to illustrate several initiatives that are focused on the Internet end its future. Considering the actual state of affairs, efforts such as Internet2, the Next Generation Internet and further advanced network initiatives are able to create Tomorrow's Internet successfully. This paper shows the significance and the theoretical potential of required high-performance networks, efficient capabilities and advanced applications that meet increasing demands and national goals. Technological developments as well as interactions and coherences among participants are going to enhance Today's Internet, indeed a specific forecast is unpredictable. Still faced with problems such as the increasing illegal use, the evolution of the Internet remains to be seen. Certainly, the legacy of advanced networks expand its possibilities and enable more people to explore the far reaches of the digital world. Forced by limitations, dynamic virtual networks are the future. Provided by several initiatives around the world, the technological progress is cut into different sections like a technological spiral. Activated by signs of fragility and limited capacities, the Internet is located in a research and development process with the purpose to pass into a privatization and commercialization process to create 21st century Internet. Promoting next generation Internet efforts, that kind of process will be never completed. If the global Internet i.e. its backbones will be replaced by advanced backbones at all, it is likely that there will be a new next generation initiative at the same time. Analyzing these advanced efforts and thinking about Tomorrow's Internet, there will be always new challenges, different in scope and objective but with the same basic goal. To establish new generations of technical environments in which entrepreneurs are able to flourish, in which minds can expand and in which applications and possibilities can reach new frontiers. A world without Internet is unimaginable.

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A STUDY ON SATISFACTION OF PRINCIPALS/DIRECTORS TOWARDS E- GOVERNANCE SERVICES OF SAVITRIBAI PHULE PUNE UNIVERSITY WITH SPECIAL REFERENCE TO AFFILIATION AND APPROVAL SECTION'S E-GOVERNANCE INITIATIVE

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ABSTRACT
Globalization has posed challenges before Indian higher education. India has one of the largest education systems in the world and there is a strong need to gear up India's higher education system in terms of quality, increased penetration and service so that India's demographic dividend does not convert into demographic liability.

The implementation of e-Governance in the higher education institutes such as universities will facilitate to overcome the challenges posed before Indian higher education. Savitribai Phule Pune University (SPPU) has implemented many e-governance initiatives in its Academics as well as in its administration to provide better delivery of its services to its stakeholders as well as to streamline its day-to-day operations.

The present study deals with the study of satisfaction of Principals/Directors towards e-Governance services of Savitribai Phule Pune University. The study analyses the responses of 151 Principals/Directors of colleges from four major branches of study affiliated to Savitribai Phule Pune University, collected through a structured questionnaire. The main focus of the research is to study whether the Principals/Directors are satisfied towards Affiliation and Approval services provided by Savitribai Phule Pune University through e-governance.

Keywords: e-governance, Savitribai Phule Pune University (SPPU), Satisfaction, Principals/Directors

INTRODUCTION
Indian Higher Education Institutions have started realizing that this is an era of extreme competitiveness and consumerism where "Education" is also a "Service". So, unless you provide quality service to the people, after sometimes with laxity would face major difficulty in attracting students. The implementation of e-Governance in the higher education institutes such as universities can help to overcome the challenge posed before Indian higher education and enable it to enjoy its demographic dividend.

Savitribai Phule Pune University started with the system of Online Affiliation of colleges and institutes as its first e-Governance initiative in the year 2007 and successfully completed many other several initiatives. Website of Savitribai Phule Pune University is accessed by its hundreds of thousands of students, alumni and also by National and International Professors, researchers and other stakeholders.

Website of SPPU delivers not only information and educational services but also interacts with its students through email, SMS Gateways and facilitates Transactions such as payment of various types of fees through well supported payment Gateways. Savitribai Phule Pune University has been felicitated by the Maharashtra state Government's "e-Governance Award" in the year 2013 in the Environment Category. It has implemented many e-governance initiatives in its Academics as well as in its administration.

The researcher through this study expressed the need to study whether the stakeholders are satisfied with the services provided by Savitribai Phule Pune University through the implementation of e-Governance. Therefore, Principals/Directors who are the heads of colleges or institutes are studied in terms of their satisfaction towards important services provided through e-Governance, Viz. Affiliation and Approval.

REVIEW OF LITERATURE
Yethiraj N. G. & Sumanth S.[1] (2017) in their article "Role of E-Governance to Strengthen Higher Education System in India" stated that an Impact of modern technology in Higher Education is required for overall development of a country. A noteworthy growth in the higher education sector made the administration of higher education institutions complex.

Prabhat Kumar[2] (2016) in his article "Dissemination, Quality and Transparency of Higher Education @e-Governance" pointed out the fact that Governance in Higher education has been unsuccessful to distribute higher education uniformly and equally from urban to remote areas of this country and Governance has failed to maintain the transparency and quality of academic and administrative activities in higher education. The author suggested solution to resolve this as the use of information and communication technology in the governance of higher education. He further stated that Government must take all those initiatives which could bring all stakeholders of higher education under one umbrella i.e. e-Governance.

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Kapoor R., &Kelkar N.[3] (2013) in their paper "E-Governance: Higher Education in Rural Area" described a route to the implementation of an e-governance to improve the quality of education in rural area and make better relationship between rural colleges and university. Further he says, E-governance can improve transparency; provide speedy information, dissemination, improving administration.

Suri G. &Kaur S.[4](2013) in their article "A study on E-Governance initiatives in Panjab University" stated that the Panjab University, Chandigarh has conceptualized many e-governance small projects/ incentives. This study tries to examine the perception of the students, faculty and staff regarding E-governess effectiveness in the Panjab University. Faculty members identified 'Proper Training' as the most effective measure to improve the current state of e-governance of the university. The study also identifies that complete implementation of E-governance in University will include building technical Hardware and Software infrastructure.

Aggrawal Rajesh[5] (2012), in his report on "Reforms in Examinations System in Universities of Maharashtra through use of Technology." details the present scenario of Universities Examinations and Key issues & challenges faced in them. The Report identifies the usage of Information Technology to make the examination and other processes secure, robust, student –friendly and infallible.

Gaikwad Sanjay[6] (2015) in his doctoral thesis "A study of e-Governance in Higher Education Institutions in Maharashtra (2001-2012)" tried to find out the relationship between e-Governance and effective management of higher education institutions in Maharashtra. His study found the following major deficiencies in the utilization of e-Governance in Higher educational Institutions in Maharashtra such as insufficient IT infrastructure, resistance for change in the work culture, lack of awareness of IT act by most stakeholders, non-availability of online payment facility on University and Institutional websites, high development cost and low returns.

RESEARCH METHODOLOGY

Objective

To study the satisfaction of Principals/Directors towards e-Governance services of Savitribai Phule Pune University with special reference to affiliation and Approval section's e-Governance initiative

Hypothesis

The Principals/Directors of Affiliated colleges/Institutes of SPPU are satisfied about affiliation and Approval section's e-Governance initiative

Data collection

The primary data was collected from 151 Principals/Directors of major four branches of study viz., Science & Technology, Humanities, Commerce & Management and Interdisciplinary Studies. The secondary data was collected through various books, journals and websites.

Population

In order that sample to be representative of the population, each of this core faculty is further split into main subject streams.

Table-1: Distribution of Broad subject-Region wise affiliated colleges/institutes

Sr. No	Faculty wise Broad subject	Pune	Ahmednagar	Nashik	Total
01	Arts	128	66	70	264
02	Mental, Moral & Social Science	05	01	00	006
03	Law	16	05	04	25
	Total- Humanities	**149**	**72**	**74**	**295**
04	Commerce	166	56	71	293
05	Management	177	22	28	227
	Total-Commerce & Management	**343**	**78**	**99**	**520**
06	Science	161	59	57	277
07	Engineering	86	13	21	130
08	Pharmacy	34	09	17	60
09	Architecture	23	01	03	27
	Total-Science & Technology	**304**	**82**	**98**	**484**
10	Education	59	24	24	107
11	Physical Education	04	01	01	06
12	Performing Arts ,Fine Arts & Crafts	09	00	03	12
	Total–Interdisciplinary Studies	**72**	**25**	**28**	**125**
	Grand Total				1424

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Thus the population of colleges/institutes under study is considered as 1424.

The population of college/institutes is 1424 as shown in table no 1.

SAMPLE SIZE

Table-2: Distribution of Sample of Principals/Directors

Sr. No.	Broad Faculty	Pune	Ahmednagar	Nashik	Total
01	Arts	13	07	07	27
02	Mental, Moral and Social Science	01	01	00	02
03	Law	02	01	01	04
	Total - Humanities	16	09	08	**33**
04	Commerce	17	06	07	30
05	Management	18	02	03	23
	Total-Commerce & Management	35	8	10	**53**
06	Science	16	06	06	28
07	Engineering	09	01	02	12
08	Pharmacy	03	01	02	06
09	Architecture	02	01	01	04
	Total- Science & Technology	30	09	11	**50**
10	Education	06	02	02	10
11	Physical Education	01	01	01	03
12	Performing Arts ,Fine Arts & Crafts	01	00	01	02
	Total–Interdisciplinary Studies	08	03	04	**15**
Total					151

From 151 colleges the selection of Principals/Directors is made by convenience sampling, thus sample size of Principals/Directors is 151.

Testing of Hypothesis
One sample K-S Test is used to test the hypothesis.

ANALYSIS AND INTERPRETATION
Section I: General Information

1. District of the Respondent's college

Table-3: Count of District wise sample of Principals/Directors

District Name	No. of Principals/Directors	% to 151
Pune	89	59
Ahmednagar	29	19
Nasik	33	22
Total	151	100

The count of number of Principals/Directors selected from each district is in proportion with the total number of affiliated colleges/institutions in that particular district. Therefore, sample is representative in terms of geographical location to draw the inferences.

2. Faculty under which the courses are taught in the college:

Table-4: Faculty wise Count of sample of Principals/Directors

Faculty	No. of Principals/Directors	% to
Science & Technology	50	33
Humanities	33	22
Commerce & Management	53	35
Interdisciplinary Studies	15	10
Total	151	100

The sample chosen is truly representative in terms of faculties/ subject streams to draw the inferences.

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3. Website of the college

Table-5: District/Faculty wise composition of sample of Principals/Directors

District/ Faculty	Science & Technology	Humanities	Commerce & Management	Interdisciplinary Studies	Total
Pune	30 (20%)	16(11%)	35(23%)	08(05%)	89(59%)
Ahmednagar	09 (06%)	09(06%)	08(05%)	03(02%)	29(19%)
Nasik	11 (07%)	08(05%)	10(07%)	04(03%)	33(22%)
Total	50 (33%)	33 (22%)	53(35%)	15(10%)	151(100%)

As all the respondents have given URL of their college and are aware of the importance of website for the dissemination of information and they fulfill the minimum requirement of implementation of e-Governance system. Thus, selection of the sample it is sufficiently representative to draw the inferences.

SECTION II: ANALYSIS OF SATISFACTION OF PRINCIPALS/DIRECTORS

A. Measuring the level of agreement about the e-Governance Components of online Affiliation system:
The Components associated with the e-Governance and their relation with the online affiliation process is listed in the following table.

Table-6: Components associated with the Satisfaction of Affiliation Process

Stmt No.	Statements about the e-Governance of Affiliation Process	Component
1	**Information** is adequately available on the SPPU website regarding the process and norms for affiliation enables ease in the filling up the online form of affiliation	Information
2	In case of queries you could easily search relevant information on the SPPU website and also could **Interact** with the university officials through e-mail, help line numbers, online support service which could facilitate the ease in the process of affiliation	Interaction
3	Payment of affiliation fees option is available through online Challan Generation facilitates ease in Performing the **Transactional** part of the affiliation	Transaction
4	Profile of the College created/filled during Affiliation process is stored in the centralized database and is made available to other SPPU services in a smooth and seamless way reducing redundancy and duplication of work and data collection **(Transformation)**	Transformation
5	Online Affiliation process is found lucid in text and **Simple**/easy to operate with	Simple
6	The information and processes of online Affiliation are consistent/in compliance with the legal framework in this regard **(Moral)**	Moral
7	Online Process of Affiliation is sufficiently paved with **Accountability** on the part of SPPU Authorities/staff	Accountable
8	Time frame is observed with the online Affiliation process with feedback & status tracking mechanism **(Responsiveness)**	Responsive
9	In Online affiliation process, you could easily seek the information about the decisions taken and their enforcement with good clarity for comprehension **(Transparency)**	Transparent
10	The Affiliation process gets completed within expected **Time** duration due to this initiative of SPPU	Timely Completion

Table-7: Frequency of Level of agreement of online affiliation service

Stmt. No.	Component Associated with Online Affiliation process	Measured on Likert Scale 1 to 5 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree					
		1	2	3	4	5	Total
1	Information	05	08	18	58	62	151
2	Interaction	15	24	16	92	04	151
3	Transaction	09	05	11	85	41	151
4	Transformation	04	15	25	68	39	151

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5	Simple	03	11	24	70	43	151
6	Moral	02	08	35	78	28	151
7	Accountable	05	09	25	80	32	151
8	Responsive	21	05	22	79	24	151
9	Transparent	12	12	12	82	33	151
10	Timely Completion	03	05	15	84	44	151
	Total	**79**	**102**	**203**	**776**	**350**	**1510**
	Total	**181**	**203**	**1126**			
	Total %	**12**	**13**	**75**			

The frequency of level of agreements is computed in percentage scale for the purpose of comparison and checking it against the threshold limit and is shown in the table below.

Table-8: Frequency in percentage of Level of agreement of online affiliation service

Stmt. No.	**Component Associated with Online Affiliation Process**	**Measured on Likert Scale 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree**					
		1	2	3	4	5	Total
1	Information	3	5	13	38	41	100
3	Interaction	10	16	10	61	03	100
3	Transaction	6	3	8	56	27	100
4	Transformation	3	10	16	45	26	100
5	Simple	2	7	16	47	28	100
6	Moral	1	5	24	51	19	100
7	Accountable	3	6	17	53	21	100
8	Responsive	14	3	15	52	16	100
9	Transparent	8	8	8	54	22	100
10	Timely Completion	2	3	10	56	29	100
	Total	52	66	137	513	232	**1000**
	Total	**118**	**137**	**745**			
	Total %	**12**	**13**	**75**			

B. Measuring the level of agreement about the e-Governance Components of online Approval System

The Components associated with the e-Governance and their relation with the online Approval process is listed in the following table.

Table 9: Components associated with the Satisfaction of Approval Process

Stmt No.	**Statements about the e-Governance of Approval Process**	**Component**
1	**Information** available on the SPPU website regarding the process and norms for Approval enables me filling up the online form of Approval with ease	Information
2	In case of queries you could easily **search** relevant information on the SPPU website and could easily **interact** with the university officials through e-mail, help line numbers, online support service in the process of Approval	Interaction
3	With Online Challan Generation facility I could pay the fees and complete the transactional part of the Approval process	Transaction
4	Profile of the Teacher created/filled during Approval process is stored in the Centralized database and is made available to other SPPU services in a smooth and seamless way reducing redundancy and duplication of work and data collection	Transformation
5	Online Approval process is found lucid in text and **simple/easy** to operate with	Simple
6	The information and processes of online Approval are consistent/in compliance with the legal framework in this regard	Moral
7	Online Process of Approval have enough reflection of the **accountability** of SPPU Authorities	Accountable
8	Time frame is observed with the online Approval Process with feedback & status tracking mechanism	Responsive

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9	A fair order of processing the applications and equity in application of norms is observed.	Transparent
10	Teachers receive their Approval **within reasonable time** due to this initiative of SPPU	Timely Completion

Table-10: Frequency of Level of agreement regarding Online Approval Process

Stmt. No.	Component Associated with Online Approval process	Measured on Likert Scale 1 to 5 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree					
		1	**2**	**3**	**4**	**5**	**Total**
1	Information	04	12	22	68	45	151
2	Interaction	09	15	39	51	37	151
3	Transaction	03	09	14	71	54	151
4	Transformation	05	13	18	69	46	151
5	Simple	04	13	15	71	48	151
6	Moral	05	16	21	64	45	151
7	Accountable	08	17	20	64	42	151
8	Responsive	15	26	27	49	34	151
9	Transparent	13	18	11	64	45	151
10	Timely Completion	07	14	32	58	40	151
	Total	73	153	219	629	436	**1510**
	Total	226	219	1065			
	Total %	15	14	71			

Table 11: Frequency in percentage of Level of agreement of Online Approval Process

Stmt. No.	Component Associated with Online Approval process	Measured on Likert Scale 1 to 5 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree					
		1	**2**	**3**	**4**	**5**	**Total**
1	Information	3	8	15	44	30	100
2	Interaction	6	10	26	33	25	100
3	Transaction	2	6	9	47	36	100
4	Transformation	3	9	12	45	31	100
5	Simple	3	9	10	46	32	100
6	Moral	3	11	14	42	30	100
7	Accountable	5	11	13	43	28	100
8	Responsive	10	17	18	32	23	100
9	Transparent	9	12	7	42	30	100
10	Timely Completion	5	9	20	39	27	100
	Total	49	102	144	412	292	1000
	Total	151	144	705			
	Total %	15	14	71	100		

The analysis of data of responses from Principals/Directors about the satisfaction of e-governance of Affiliation and Approval system indicates that in each case the results are much above the threshold of 50% with reference to the statements and agreements, and overall satisfaction. Therefore, they are supportive to hypothesis.

TESTING OF HYPOTHESIS

H_1: Principals/Directors of Affiliated colleges/Institutes of SPPU are satisfied about Affiliation and Approval section's e-Governance initiatives**.**

H_0: Principals/Directors of Affiliated colleges/Institutes of SPPU are NOT satisfied about Affiliation and Approval section's e-Governance initiatives.

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RESULT OF ONE SAMPLE K-S TEST

Table-12: One sample K-S test result for Responses of Affiliation Section's services

		Q 1	Q2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10
Component and Characteristics tested		**Information**	**Interaction**	**Transaction**	**Transformation**	**Simple**	**Moral**	**Accountable**	**Responsive**	**Transparent**	**Timely Completion**
N		151	151	151	151	151	151	151	151	151	151
Normal Parameters[a]	Mean	4.0861	3.7020	3.9536	3.8146	3.9205	3.8079	3.8278	3.9272	3.7417	4.0662
	Std. Deviation	1.01941	.88540	1.00888	1.01590	.95585	.84629	.94348	.94586	1.12821	.83800
Most Extreme Differences	Absolute	.261	.367	.353	.281	.281	.292	.314	.312	.352	.316
	Positive	.185	.242	.210	.169	.182	.225	.216	.211	.191	.240
	Negative	-.261	-.367	-.353	-.281	-.281	-.292	-.314	-.312	-.352	-.316
Kolmogorov-Smirnov Z		3.208	4.508	4.335	3.453	3.459	3.585	3.860	3.836	4.327	3.885
Asymp. Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Table-13: one sample K-S test result for Responses of Approval Section's services

		Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10
Component and Characteristics tested		**Information**	**Interaction**	**Transaction**	**Transformation**	**Simple**	**Moral**	**Accountable**	**Responsive**	**Transparent**	**Timely Completion**
N		151	151	151	151	151	151	151	151	151	151
Normal Parameters[a]	Mean	3.9139	3.6093	4.0861	3.9139	3.9669	3.8477	3.7616	3.4040	3.7285	3.7285
	Std. Deviation	.99960	1.13709	.93052	1.03241	1.00278	1.06926	1.13554	1.28156	1.24865	1.09504
Most Extreme Differences	Absolute	.283	.217	.291	.295	.301	.278	.285	.229	.308	.247
	Positive	.168	.121	.179	.162	.169	.145	.139	.135	.154	.137
	Negative	-.283	-.217	-.291	-.295	-.301	-.278	-.285	-.229	-.308	-.247
Kolmogorov-Smirnov Z		3.473	2.669	3.575	3.623	3.702	3.422	3.504	2.811	3.784	3.034
Asymp. Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

DISCUSSION AND INFERENCES

Table 12 and 13 shows the results of one sample K-S test applied to components of satisfaction. Total 20 variables of satisfaction were tested using One Sample K-S test.

It is observed that P values are (0.00) of all 20 variables are significantly less than 0.05 (alpha level of significance).

As P values are of all 20 variables are significantly less than 0.05 (alpha level of significance) which indicates that null hypothesis H_0 is rejected.

CONCLUSION

The analysis of data and testing of hypothesis indicates thatthe Principals/Directors are satisfied with e-Governance initiatives of Savitribai Phule Pune University's Affiliation and Approval section.

In case of online affiliation process, Principals/Directors are more satisfied about

1. The information available on the website for filling up online form of affiliation
2. Payment of fees through online mode
3. Availability of college profile for next processes and reduced duplication of work Ease in operation of online affiliation process
4. Consistency with the legal framework
5. Increase in the Accountability of the staff due to online affiliation process
6. Availability of Information for the decision making
7. Timely completion of affiliation process due to this e-governance initiative

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In case of online affiliation process, Principals/Directors are less satisfied about

1. Interaction with the officials through email, helpline numbers, telephonic calls
2. The feedback and status tracking mechanism available

In case of online approval process, Principals/Directors are more satisfied about

1. The information available on the website about the process of filling approval forms
2. Profile of the teacher created during approval process is available to other SPPU services in a smooth and seamless way reducing duplication of work
3. Ease in operation of online approval process
4. Payment of approval fees through online mode
5. Consistency with the legal framework.
6. Improved accountability of the staff due to online approval process.
7. Equity and fair order in processing the application forms.

In case of online approval process, Principals/Directors are less satisfied about

1. Interaction with the officials through email, helpline numbers, telephonic calls.
2. The feedback and status tracking mechanism available.
3. Delay in delivery of service (Time lag).

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Liu, W.B, Wongcha A, & Peng, K.C. (2012), "Adopting Super-Efficiency And Tobit Model On Analyzing the Efficiency of Teacher's Colleges In Thailand", International Journal on New Trends In Education and Their Implications, Vol.3.3, 108 – 114.

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