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A STUDY ON PERCEPTION ABOUT BLOCK CHAIN TECHNOLOGY WITH REFERENCE TO CONSUMERISM IN MUMBAI CITY

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ABSTRACT
The Digitalization of the payment has benchmarked the cashless economic transactions in India. Consumers has gradually shown more preference towards online trades, and rose very significantly in COVID 19 pandemic period. This period bought a huge shift in digital trades and payment than the traditional ones.

The E-commerce industry though has an tremendous increase into the trade since almost a decade, the consumers do face the transparency issues into the products or trades purchased by them in online trades. To overcome this transparency issues, Block chain Technology can play a vigorous role to chalk out the discrepancy related to online or offline buying of products from the market. Block chain technology has enhanced the supply chain management distribution system than the traditional distribution system. The BCT aids in bringing the Reliability, Assurance and Accessibility in consumerism. This further results into consumer loyalty and ultimately brand building for the traders too.

This study focuses on understanding the need of BCT awareness among consumers. How the BCT can give justice to the consumer rights and ultimately resulting into lesser ungenuine products distribution.

Key words: *Blockchain Technology, Supply Chain, Digitalization, QR Codes*

INTRODUCTION
QR codes are used by many industries for different purposes like monitoring brands, tracking time, managing records, recognizing objects, and more. They can be classified into two types: Static and Dynamic QR codes. Nowadays, QR codes are commonly seen on things like restaurant menus and wedding invitations. They are used in shipping, marketing, and even on social media. But what exactly is a QR code? Well, it's a special type of barcode that holds information. You can access this information by using a QR code scanner or the camera on your smartphone. Unlike traditional barcodes that can only be read in one direction, QR codes can be scanned from any angle and in both directions. This means they can store much more data than regular barcodes. When you scan a QR code with your smartphone, it translates the black squares and dots into understandable information for you. The QR code has become very popular nowadays, but it's important to understand its origins and recent rise in popularity. It was actually invented in 1994 by a Japanese company called Denso Wave Incorporated, which is a subsidiary of Toyota. The chief engineer, Masahiro Hara, created the QR code to help track vehicles and make Toyota's manufacturing process more efficient.

Then came the COVID-19 pandemic, and the QR code became a helpful tool for people and companies. It allowed for contactless communication and transactions, reducing the need for physical contact with surfaces. This was particularly valuable for retail stores, the hospitality industry, and the entire supply chain, as it enabled them to continue functioning while minimizing risks to workers and customers.

QR codes, short for quick response codes, are barcodes that can be scanned to store and retrieve data. In marketing, they are frequently used to direct users to specific webpages, websites, social media profiles, or to provide store coupons. A QR code consists of a square grid made up of dots. Each dot represents a one, and each blank space represents a zero in binary code. These patterns encode various sets of numbers, letters, or both, including URLs. The size of the QR code grid can vary, ranging from a minimum of 21 row's by 21 columns to a maximum of 177 row's by 177 columns.

How Do QR Codes Work?
To understand how QR codes work, let's examine their structure. A QR code consists of patterns that can only be interpreted by a QR reader.

When we look at a QR code, it appears as a pixelated square with three larger squares surrounding it. Once you use a QR reader or your mobile device to scan the QR code, it retrieves the information contained within the code by identifying the three larger squares. QR codes are composed of six main elements:

Quiet Zone: This is the white empty border surrounding the pixelated black square. It allows for successful scanning by removing any interference from surrounding elements.

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Finder Pattern: The larger squares at the edges of the QR code are called finder patterns. They indicate the boundaries of the code to the QR code reader.

Alignment Pattern: This smaller square enables users to scan QR codes even when they are at an angle or slightly distorted.

Timing Pattern: The timing pattern facilitates QR code scanning even if the code is damaged. It is represented by an L-shaped line that runs between the three large squares.

Version Information: Located at the top-right of the finder pattern, this small area helps the reader identify the version of the QR code.

Data Cells: The remaining area within the QR code contains the stored data, which can include various types of information such as audio files, web addresses, contact details, payment information, or links to app stores. By understanding the anatomy of a QR code, we can appreciate how it functions to store and retrieve data.

Types of Blockchain

1. Public blockchains

Public blockchains are open and decentralized networks that allow anyone with a computer and internet access to participate. Public blockchains are accessible to anyone, without any restrictions or ownership by a specific entity. They are designed to promote inclusivity and decentralization. Individuals can join the network by becoming authorized nodes, which involves contributing computing power for tasks such as verifying transactions and maintaining the blockchain ledger. Public blockchains, such as Bitcoin, employ distributed ledger technology (DLT) and consensus algorithms to achieve decentralization and security. Consensus algorithms, such as proof of work (PoW) and proof of stake (PoS), enable participants to reach agreement on the current state of the ledger.

Participants in the network can access and verify past and current records. Mining activities, involving complex computations, are performed to validate transactions and add them to the ledger. The open nature of the blockchain ensures transparency and prevents tampering with verified records.

2. Private Blockchain

Private blockchains are indeed designed for use within a closed network or organization, where selected nodes have permission to participate. Transactions in private blockchains can be processed quickly due to the smaller size of the network and fewer nodes involved. The scalability of a private blockchain can be adjusted and customized to meet the specific needs of the organization. The controlling organization has the ability to set permissions, security measures, and accessibility levels, providing greater control over the blockchain network.

3. Hybrid Blockchain

Hybrid blockchains combine elements of both public and private blockchains, allowing organizations to have a private, permission-based system alongside a public, permissionless system. It uses a mix of permission-based and permissionless systems, and user access to information is facilitated through smart contracts. Transactions and records in a hybrid blockchain are not publicly visible but can be verified when necessary, ensuring confidentiality while maintaining verifiability. The primary entity that owns the hybrid blockchain cannot alter transactions. User identities are protected within the network, and their identity is revealed only when engaging in a transaction.

4. Consortium Blockchain

Consortium blockchains, also known as federated blockchains, involve multiple organizational members collaborating on a decentralized network. They have features of both private and public blockchains, with limited access granted to a specific group of organizations. In a consortium blockchain, consensus procedures are controlled by preset nodes, and there is a validator node that initiates, receives, and validates transactions. Member nodes can also participate in receiving or initiating transactions. It can be used to track and verify the provenance of goods, particularly in industries like food and medicine.

Advantages blockchain technology offers to supply chains

Indeed, the functioning of blockchain technology brings several advantages to supply chains. Here is a summary of the fundamental advantages:

1. **Traceability:** Blockchain enables easy mapping and visualization of supply chain steps, providing enhanced traceability of each element involved, such as supplier information, procurement, and delivery of goods. This helps in identifying the origin and journey of products, ensuring transparency and accountability.

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2. **Transparency:** Blockchain fosters trust among supply chain parties by providing open access to key data points. It allows participants to view and verify transactions, ensuring transparency in the movement of goods and transactions between different entities in the supply chain.
3. **Speed:** Blockchain incorporates smart contracts, which are self-executing contracts with predefined conditions. When these conditions are met, the corresponding actions are automatically updated. This eliminates the need for slow and manual processes, streamlining operations and reducing delays in supply chain activities.
4. **Immutability:** The decentralized nature of blockchain, with multiple copies of the ledger distributed across different nodes, makes it highly resistant to tampering and fraud. Any alteration to a specific transaction would require simultaneous changes to all copies, which is nearly impossible. This immutability ensures the integrity and trustworthiness of supply chain data.
5. **Consensus:** In a supply chain, consensus among parties is crucial for smooth operations. Blockchain technology facilitates consensus by automating and validating transactions. All participants in the blockchain network can trust that the transactions are accurate and agreed upon, eliminating the need for intermediaries and reducing disputes.

These advantages contribute to the improvement of supply chain management by enhancing transparency, efficiency, security, and trust among participants. Blockchain technology has the potential to revolutionize supply chains by providing a decentralized, tamper-proof, and verifiable system for recording and tracking transactions.

RESEARCH METHODOLOGY

This research outlines the systematic approach adopted to investigate consumer perceptions of blockchain technology in the context of consumerism within Mumbai City. It details the research design, data collection methods, sampling techniques, and analytical tools used to gather and interpret data. The methodology is structured to ensure a comprehensive understanding of how blockchain can influence consumer trust, transparency, and purchasing decisions, thereby supporting the study's objectives.

OBJECTIVES OF THE RESEARCH

1. To understand the conceptual framework on Consumerism and blockchain Technology.
2. To study the perception of the consumers towards the BCT and consumerism.
3. To enforce the rights of the people as consumers against unauthentic products.
4. To understand the role of transparency in conscious consumerism.
5. To create an Awareness among the consumers about the blockchain Technology

SCOPE OF THE RESEARCH

- The geographical scope is limited to **Mumbai suburbs**.
- The study targets a broad demographic including students, working professionals, and business owners.
- Focuses primarily on **consumer perception**, **awareness**, and **readiness** to adopt BCT-enabled products and services.

RESEARCH METHOD

- **Sampling Method**: Simple Random Sampling based on **convenience** and **accessibility**.
- **Sample Size**: 100 valid responses were collected from residents in Mumbai suburbs.
- **Primary Data Collection**:
  - **Structured questionnaire** circulated digitally and physically.
  - **Interviews** conducted with selected participants having a basic understanding of blockchain.
- **Data Analysis**: Statistical analysis using frequencies, percentages, and descriptive statistics.
- **Secondary Data**: Information from academic articles, reports, and industry whitepapers related to BCT and consumerism.

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LIMITATIONS OF THE RESEARCH

Limited Geographic Reach: Focused only on Mumbai suburbs, thus findings may not be generalized across other regions.

Sample Bias: Participants are mostly students and urban tech-savvy individuals; older or rural populations are underrepresented.

Awareness Gap: Many participants lacked prior knowledge of BCT, which may affect the depth of their responses.

Short Time Frame: The study was conducted over a limited period, restricting longitudinal insights.

LITERATURE REVIEW

Recent literature emphasizes the transformative potential of blockchain technology across various sectors, particularly in enhancing transparency, security, and trust. Bhatia et al. (2024) conducted a comprehensive review highlighting the evolution of blockchain, its major challenges, and issues like platform compatibility and security risks. Sargenta and Breese (2023) focused on blockchain adoption barriers in supply chains, such as interoperability issues and high implementation costs. An et al. (2023) provided a forward-looking review, identifying trends in blockchain applications and suggesting its increasing role in governance and finance. In healthcare, Nguyen (2023) outlined the challenges blockchain faces in data privacy, scalability, and regulatory compliance. Gramlich et al. (2023) explored decentralized finance (DeFi), reinforcing blockchain's role in disintermediating traditional financial systems while pointing to the need for regulatory clarity. Together, these studies underline blockchain's promise and the need for increased awareness, education, and supportive infrastructure to realize its full consumer and industry potential.

DATA ANALYSIS

The data collected from 100 valid respondents in Mumbai suburbs revealed insightful trends regarding the awareness and perception of blockchain technology. A majority of the respondents (60%) were somewhat familiar with blockchain, while 47.6% had prior awareness of its role in consumerism. Notably, over 74% agreed that consumers should have access to detailed information about product sourcing and manufacturing, showing a strong inclination towards transparency.

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18	7	5.6	7.0	7.0
	19	43	34.1	43.0	50.0
	20	44	34.9	44.0	94.0
	21	2	1.6	2.0	96.0
	22	2	1.6	2.0	98.0
	36	2	1.6	2.0	100.0
	Total	100	79.4	100.0	
Missing	System	26	20.6		
Total		126	100.0		

About 55% of participants reported encountering counterfeit products, indicating a need for authentication solutions. A significant proportion (81%) expressed interest in learning more about blockchain's consumer benefits. Preferences for blockchain-enabled products were generally positive, with 44% likely or very likely to choose such products.

How would you rate your overall financial situation?

	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Excellent	22	17.5	22.0	22.0
	Good	37	29.4	37.0	59.0
	Fair	20	15.9	20.0	79.0
	Poor	21	16.7	21.0	100.0
	Total	100	79.4	100.0	
Missing	System	26	20.6		
Total	126	100.0			

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How familiar are you with the concept of blockchain tech2logy?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Familiar	20	15.9	20.0	20.0
	Somewhat Familiar	60	47.6	60.0	80.0
	Not Familiar	20	15.9	20.0	100.0
	Total	100	79.4	100.0	
Missing	System	26	20.6		
Total		126	100.0		

Out of 100 valid respondents, a significant portion remained neutral (51%) when asked about their likelihood of choosing products or services that utilize blockchain technology to ensure authenticity and transparency. This suggests uncertainty or limited awareness among consumers. However, 44% (13% very likely + 31% likely) expressed a positive inclination toward such products, indicating growing trust and interest in blockchain-based solutions.

How likely are you to choose products or services that utilize blockchain tech2logy to ensure authenticity and transparency?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Likely	13	10.3	13.0	13.0
	Likely	31	24.6	31.0	44.0
	Neutral	51	40.5	51.0	95.0
	Unlikely	3	2.4	3.0	98.0
	Very Unlikely	2	1.6	2.0	100.0
	Total	100	79.4	100.0	
Missing	System	26	20.6		
Total		126	100.0		

The majority of respondents emphasized the importance of transparency in the supply chain when making purchasing decisions. Specifically, **37%** rated it as **"Very Important"** and **35%** as **"Important"**, totaling **72%** who recognize and value supply chain visibility. This indicates that a large portion of consumers are conscious of where and how products are made, aligning with ethical and informed purchasing behavior. Meanwhile, **26%** remained **neutral**, possibly due to limited awareness or indifference, and only **2%** considered it **"Not Very Important."**

How important is transparency in the supply chain (e.g., knowing where and how a product was made) when making purchasing decisions?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Important	37	29.4	37.0	37.0
	Important	35	27.8	35.0	72.0
	Neutral	26	20.6	26.0	98.0
	Not Very Important	2	1.6	2.0	100.0
	Total	100	79.4	100.0	
Missing	System	26	20.6		
Total		126	100.0		

A strong majority of respondents (**81%**) expressed interest in learning more about how blockchain technology can benefit consumers and ensure product authenticity. This indicates a high level of curiosity and openness towards adopting new technologies that enhance trust and transparency in the marketplace. Only **19%** were not interested, suggesting a relatively small portion of the population may be resistant or unaware of blockchain's relevance. The overall response highlights a promising opportunity for educational initiatives and awareness campaigns to further engage consumers and promote blockchain adoption in consumer-related sectors.

Would you be interested in learning more about how blockchain technology can benefit consumers and ensure product authenticity?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, I am interested	81	64.3	81.0	81.0
	No, I am not interested	19	15.1	19.0	100.0
	Total	100	79.4	100.0	
Missing	System	26	20.6		
Total		126	100.0		

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OBSERVATIONS AND SUGGESTIONS:

Clarity and Scope: The objectives and methodology are well-defined, focusing on practical applications and consumer-centric insights. Expansion beyond Mumbai suburbs could provide broader applicability. Urban consumers, especially younger demographics, are generally more familiar with QR codes due to their prevalence in digital payments and e-commerce. However, there is likely a knowledge gap among older generations or individuals in semi-urban areas, as highlighted in the literature review. Consumers familiar with QR codes often make more informed and ethical purchasing decisions. Brand loyalty is enhanced when QR codes provide detailed and accurate product information.

SUGGESTIONS

1. Conduct awareness campaigns to bridge this gap. Include questions in surveys that assess awareness levels by age, occupation, and education.
2. Partner with local businesses, government bodies, and NGOs to promote QR codes.
3. Test strategies in pilot campaigns and refine based on feedback.
4. Propose training sessions or easy-to-use tutorials for older or less tech-savvy users.
5. Investigate data security measures to ensure user confidence in QR code usage.

CONCLUSION

This study on the perception of blockchain technology in relation to consumerism in Mumbai City highlights the growing awareness and acceptance of this emerging innovation. The findings suggest that while blockchain technology is recognized for its potential to enhance transparency, security, and efficiency in transactions, its widespread adoption still faces challenges such as lack of technical knowledge, regulatory uncertainties, and implementation costs.

Consumers in Mumbai exhibit a cautious yet optimistic stance toward blockchain applications, especially in sectors like e-commerce, finance, and supply chain management. The ability of blockchain to enhance trust and reduce fraud has been well received, indicating its potential to revolutionize consumer experiences. However, for blockchain to be widely adopted, greater awareness campaigns, policy support, and simplified integration strategies are necessary.

Overall, this study reaffirms that blockchain technology holds significant promise for reshaping consumer interactions and business models. As more industries integrate blockchain into their operations, consumer trust and engagement are likely to improve, paving the way for a more secure and transparent marketplace. Future research could explore deeper industry-specific applications and the evolving regulatory landscape that will shape blockchain's role in consumerism in the coming years.

BIBLIOGRAPHY & REFERENCES

- An, M., Fan, Q., Yu, H., & Zhao, H. (2023). *Blockchain technology research and application: A systematic literature review and future trends*. arXiv. https://arxiv.org/abs/2306.14802
- Bhatia, M., Kumar, R., & Kumar, M. (2024). An extensive multivocal literature review of blockchain technology: Evolution, challenges, platforms, security, and interoperability. *Transactions on Emerging Telecommunications Technologies, 35*(11), e5037. https://doi.org/10.1002/ett.5037
- Gramlich, V., Guggenberger, T., Principato, M., & et al. (2023). A multivocal literature review of decentralized finance: Current knowledge and future research avenues. *Electronic Markets, 33*, Article 11. https://doi.org/10.1007/s12525-023-00637-4
- Nguyen, A. M. (2023). *Challenges of blockchain applications in digital health: A systematic review*. arXiv. https://arxiv.org/abs/2304.04101
- Sargenta, C. S., & Breese, J. L. (2023). Blockchain barriers in supply chain: A literature review. *Journal of Computer Information Systems, 64*(1), 124–135. https://doi.org/10.1080/08874417.2023.2175338