

Customer Centric Blockchain Phenomenon in Global Perspective

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ABSTRACT

Purpose: Blockchain is anticipated to be a technology having a potential to lead into a next technology revolution, with new paradigms of doing business in various industries. The purpose of the present research is to discuss the evolution and analyze the blockchain in a global perspective and further to find out its potential benefits for customers in a wide variety of areas ranging from financial sector, healthcare, supply chain management, e-commerce, and retail to energy sector etc.

Design/Methodology/Approach: The study is primarily based on secondary data collected from various sources. The study has focused on the areas where blockchain technology is primarily being used. For each area, target customers are identified and the impact of the technology in particular areas is assessed for them.


Findings: Findings of the study reveals that blockchain stands to revolutionize the customer's experience significantly by offering greater transparency, reduced costs, privacy and security etc.

Originality/Value: Blockchain being the recently emerging technology has the huge potential to transform the way various industries and businesses perform their various functions. This technology is considered to be a vital point for the decentralization of the infrastructure and to strengthen the trust issues. The present study focuses on the blockchain terminology in context of customers and analyzes it in a global perspective and also highlights its associated challenges and opportunities.

Paper Type: Theme Based Paper

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Introduction

The idea of Blockchain was conceived by Satoshi Nakamoto in 2008 through Cryptocurrency, Bitcoin and Digital payment. Later, it was generalized to distributed ledgers known as Blockchain. It is basically a distributed ledger which records transactions in a series of blocks, with each new occurring transaction, a new block is generated and added to the previous series that in a way makes the ledger more secure and transparent. Blockchain has the potential to revolutionize the way businesses are conducted and to enhance customers' experience thus improving buyer and seller relations. However, there is a lack of studies focusing on "what implications can blockchain have for customers?". To fill this existing gap the present study attempts to give an overview how blockchain can be beneficial for customers in diverse areas. The study has focused on the areas where blockchain technology is primarily being used. For each area, target customers are identified and the impact of the technology in particular areas is assessed for them.

The present study aims to discuss the evolution and analyze the blockchain in a global perspective. The study further intends to highlight the challenges and the opportunities of blockchain technology. To achieve the stated objectives, the study is divided into following sections: Section I gives the overview of the evolution of blockchain technology, Section II blockchain technology used for various purposes in across globe, Section III highlights the customer centric blockchain phenomena, Section IV pinpoints the challenges and opportunities involved in blockchain, and Section V & Section VI encompasses conclusion and references.

Evolution of Blockchain

Over the last 10 years the blockchain idea first proposed by Satoshi Nakamoto has undergone through rapid incremental evolutions. Blockchain has gone through three evolutionary stages that are Blockchain 1.0, 2.0 and 3.0 and the fourth generation of blockchain i.e. 4.0 is on the emerging stage. The comparative evaluation of the different series of blockchain is given below in table 1.

Table 1: Series of Blockchain

S. No	Blockchain Series	Year	Term Pin Point	Primarily Concern	Value Driver	Enablers	Examples
1.	Blockchain 1.0	2009	Cryptocurrency	Conduct payment activities using digital tokens, coins, or currencies	Transaction cost	Decentralized consensus	Bitcoin- Litecoin, Dogecoin, Reddcoin are the cryptocurrencies; a form of electronic cash.
2.	Blockchain 2.0	2014	Smart contract	Ready to use programs that functioning on predetermined conditions on real time basis	Ability to emulate human behaviour	Smart contracts	Ethereum- Platform that runs smart contracts. BAT- Open source decentralized ad exchange program seek to address fraud and opaqueness in digital advertisement
3.	Blockchain 3.0	2017	Cloud services and multilayer middleware	Decentralized software architectures that allow near infinite scalability	Organization boundaries	Decentralized applications, storage and computing	Cardano- Technological platform that runs financial applications. AION- A multilayer blockchain system designed to resolve the issue of privacy, scalability and interoperability.
4.	Blockchain 4.0	2019	Artificial intelligence (AI) and Internet of things (IOT)	Individual chains within the complex structure work independently while still remaining connected	Autonomous decision-making	Decentralized Artificial-intelligence	Seele- Platform that aims to spearhead development in internet of value era.

**Source: Prepared by the authors*



Ever since January 2009, blockchain technology has been growing and evolving. Blockchain evolved with the introduction of bitcoin and first generation blockchains gives a proof of work consensus blockchains where the nodes do maximum of the work through hashing power with voting power. Implementation of Bitcoin has many challenges including scalability, expensive mining etc. many experts could see that blockchain had use cases that far exceeded Bitcoin's need. This gave rise to the second generation of blockchain. Blockchain 2.0 (Smart contract) is an extension of Blockchain 1.0. Second evolution of blockchain started around 2014. This second generation as an improvement over the first permitted the technology to develop a platform through the concept of virtual distributed machine. Initially, Blockchain was not programmable, but with the updation of technology, blockchains have emerged with many more functions. Now, blockchain fulfills the specific functions and has also expanded the scope for market decentralization.

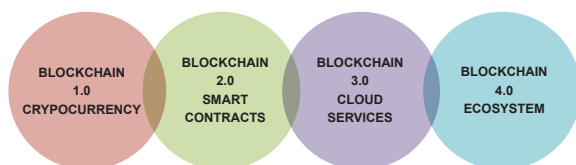


Figure 1: Evolution of Blockchain

With the rise of Blockchain 3.0 in 2017 the blockchain systems have become more efficient, scalable, highly interoperable, and have a better user experience than before.

The key feature of this generation is interoperability that allows various blockchain to associate with each other. It has vast array of applications like art, health, science, governance, education, culture, public goods and communication. Blockchain 4.0 has emerged in recent times which offer significant value opportunities like artificial Intelligence (AI) that allows individual chains within the complex structure to work independently of each other while still remaining connected. Recently it has attracted the attention of the industry. This evolution of Blockchain promises to change people's lifestyles extensively and profoundly. More potential of this generation are yet to be realized. Blockchain has the huge potential to move into the future, this is just the beginning; time is not far when the technology will embrace the entire world like the internet.

Blockchain Technology Used for Various Purposes Across Globe:

Undoubtedly blockchain is the revolutionary digital technology that has established interminable puff in the last decade. The technology has seen major implementation across the globe in various industries since 2017. The technology has the potential to be a force for the future. Countries across the world embracing it to their diverse industries including healthcare, governance, securities, real estate, finance, trade etc. table below gives an overview from the real world of the countries using blockchain technology in various dimensions to improve and create a massive impact on their economies.

Table 2: Block chain technology in various countries

S. No.	Country	Focus Area	Uses of Technology
1.	Singapore	Financial Sector	In Asian countries Singapore leads to adopt technology and digital currency innovations. Singapore Central Bank would be the first one to issue a national digital currency. Currently there is a project named 'UBIN' led by monetary authority of Singapore that would be using Digital Ledger Technology for lowering clearing and settlement costs.
2.	South Korea	Payments and Settlements	The bank of Korea is on the way to implementing blockchain solutions to replace interbank transactions, payments and settlements. Blockchain initiative called 'Aergo' supported by a company named 'Blocko' is working on providing blockchain decentralized solutions. The South Korean government has announced a budget of 5 trillion Won for the growth and innovation in the field of blockchain and artificial intelligence in 2019.
3.	England	Banking Industry	The Bank of England is analyzing the possibility of issuing Central Bank Digital Currency (CBDG), with the objective to help the firms to improve the payment system and to process transactions.
4.	Ukraine	Digital Currency	The country is also analyzing the possibility to issue a local digital currency, which will enable individuals to move funds more efficiently.
5.	UAE	Smart City	UAE is working on making Dubai a smart city based on blockchain technology. It aims to make Dubai the first powered by blockchain in the world.
6.	China	Banking Industry	Many banks in China like Bank of China, China construction bank are implementing blockchain based solutions, in 2017, China filed the largest blockchain patent in the world.
7.	Japan	Banking Industry	The European Central Bank (ECB) and Bank of Japan have undertaken a joint project 'STELLA' that focuses on the usage of digital ledger technology for financial market instruments.
8.	India	Banking Industry and Supply chain Management	India's Central bank, RBI, announced its own cryptocurrency and Niti Aayog is also working with hospitals on applying blockchain technologies in pharmaceutical supply chain management to detect spurious drugs.
9.	Dutch	Digital Ledger Technology	The Dutch government also has been working on blockchain projects in the field of digital identity, improved regulation for subsidies on electric vehicles and a system to track employee's record.
10.	Germany	Insurance Sector	In Germany, blockchain technology is being used by many insurance giants for flight delay insurance through customer notification on smart phone and making payment in customer's bank account.

*Source: Prepared by the authors

Customer Centric Blockchain Phenomenon:

Blockchain has emerged as the most important and troublesome technology in the world being adopted by many industries now. It is a revolutionary technology which has disrupted industries. The technology was originally designed for virtual currency like Bitcoin and because of its effectiveness, has found its way into other areas of the digital world. For customers the technology promises to revolutionize their experience the way they interact with the digital world. There are wide varieties of areas such as financial sector, supply chain management and logistics, e-commerce, retailing, personal healthcare, e-voting, energy sectors etc where customers are being benefited by blockchain technology. Some of the major areas where customers are benefiting from blockchain are explained below:

Financial Sector

Recent development of blockchain has the great potential to overcome the existing barriers in the smooth flow of financial services. This technology has potential to reduce bank's processing costs and bring more security and genuineness in day to day transactions. It will make remittance and payment processing faster by eliminating third parties. For example 'OPENBAZAAR' is a decentralized marketplace that allows a direct trade in goods and services between buyers and sellers without the help of any intermediary. Individual transactions are linked to a previous database that reduces the chances of fraud. 'BARCLAYS' has launched blockchain initiatives to combat fraudulent practices. Independent verification of a single customer accessed by all other organizations will save the hassle to the consumer of going all over again with the Know Your Customers (KYC) process. It will remove the role of all unnecessary intermediaries, stages and bureaucracy involved in stock exchange and share trading enabling them to run via computers all over the world.

Supply Chain Management

Over a century ago, supply chains were relatively much simpler because trade was local, but as of now, since manufacturing has been globalized they have grown incredibly complex. This rise in complexity halts supply chains from working well. Blockchain offers many solutions to improve supply chain management in many ways. Blockchain allows traceability from the place of manufacture to the place of customers to have a check whether the process is tempered anywhere in between that is of high use for drugs and pharmaceutical industries. Blockchain makes supply chain more auditable and can provide customers with assurance that goods are fairly produced and fairly sourced and are not in any violation of human rights such as child labors, forced labor etc. For example 'ORIGINTRAIL' enables customers to get to know how the goods were produced. Customers preferring domestic goods, sustainable manufacturing, organic food and other such preferences would be provided with a clear and verifiable way to identify goods and services that meets their demands and desires

E-Commerce

In E-Commerce, blockchain will completely change the way of shopping and buying process by improving security and efficiency by making transactions more transparent. By storing and sharing of information on a blockchain platform, depending on their own discretion customers will be able to decide how and to whom they wish to share their personal information which will empower consumers with more transparent and secure transactions. It also leads to faster, less expensive and more secure e-commerce payments and transactions.

Retailing

Customer experience is integral to the retail sector. Due to the change in modus operandi and due to technological advancement, the traditional unit of measure for retail performance has changed from "sales per square foot" to "experience per square foot". Blockchain enables higher customer satisfaction, improved buying habits, higher profits for retailers and more secured transactions. 'LOYAL' a smart contract allows creating customized programs for multi branded rewards. An Artificial Intelligence powered layer called Neuron deploys a customer prediction algorithm to get predictions related to customer preference and purchase intent.

Smart Contracts

Smart Contracts are enforcing contracts governed by explicit terms and conditions lay out within them. Exchange of money, shares, property etc are governed by virtual agreements. 'AETERNITY' is a blockchain application which allows the activation of smart contracts when the network ensures that the pre requisite conditions to the contracts have been met and the when the parties get agree to the conditions, payments are made automatically. Smart contract helps in speeding up the claiming process and helps in executing contracts automatically. For example 'ACCENTURE' uses blockchain to build insurance solutions for its clients to boost their efficiency and productivity.

Healthcare

Blockchain has considerable promise in healthcare as it helps in maintaining electronic health records and for supply chain for clinical trials. Blockchain can store patient data in all the nodes of a blockchain platform. Allowing hospitals, insurance companies, and patient's access to medical records may benefit the industry as a whole. The projects like 'Medrec', 'MIT' and CoonectingCare helps in maintaining electronic medical records and also helps in tracking progress of patients. It can provide a useful tool for controlling who should, and who shouldn't have access to patient's personal data.

Energy Sector

Use of the blockchain technology in the energy sector will shape its future in a better way by reducing transaction costs across the system, increased efficiency and by delivering



cost benefits to customers. Blockchain would ensure greater transparency for consumers by allowing them to track exactly where the electricity is being produced and how it is supplied. It will also help in reducing the operating costs by eliminating the intermediaries, this would lower the energy bills for consumers and they would get an option to choose their own energy supplier.

Challenges and Opportunities in Blockchain Technology:

Challenges in Blockchain technology:

1. The key limitation of blockchain technology is the scalability. Every time a new transaction is conducted a node is added to the previous ledger. This results in an increased history and thus the system gets the danger of bulking.
2. The technology is time consuming too, it has a mandatory requirement of peer to peer verification every time a transaction is conducted that results in a much slower process.
3. The technology uses encryption permanently, which requires a mining system that results in huge energy consumption.
4. As the technology is surpassing these days, its regulation has become a big issue. Blockchain based smart contracts are based on their own conditions thus lack of any regulation.
5. No technology is completely secure. Privacy under the blockchain is also a big issue.
6. Blockchain technology is still being new and evolving, there is a lack of proper infrastructure and personnel capacity to handle it.

Opportunities in Blockchain Technology:

1. The technology with a wide range of applicability from healthcare, banking, supply chain management to retailing has changed the way data is stored and processed.
2. It will result in innovative business models for companies of different types.
3. Trust, security and transparency of blockchain technology can immensely help the enterprises to improve their business process and solve a wide range of their issues and challenges.

Conclusion

The researcher gives insight into how blockchain will impact customers' perspective in different areas in global phenomena. The insights will be valuable for future research

to understand the current state of research from both academia and industries point of views. Blockchain technology being an emerging disrupter has changed the way businesses are conducted. It tends to revolutionize how society trades and interacts. The technology is gaining physically powerful impetus and thrust around the globe. Customers can enjoy many advantages with the usage of blockchain technology by elimination of intermediaries that in a way results in having direct communication with the service provider, more trust, better relationships, less corruption, reduced transaction costs, faster process, better access, thus more efficiency and less censorship in business process and service offerings. Blockchain technology ensures more efficient exchanges in interaction between buyer and seller. Blockchain empowers consumers with more transparent and secure transactions. It also leads to faster, less expensive and more secure payments. Blockchain technology stores every transaction which helps the organizations to check the pattern of payment in real time as of when required. With the blockchain, it becomes easy to share different offers with the customers like reward points, cash back, personalized retail price and other promotional offers. It also offers different payment modes to customers.

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Annexure 14.2

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Reviewers Memorandum



Reviewer's Comment 1: The study is planned in a systematic manner and with the disruption of technology the choice of topic is very appropriate. The study will help researchers and practitioners quickly give an overview of the research state of blockchain from the customers' perspective across a wide variety of areas.

Reviewer's Comment 2: The authors have done comprehensive work in the area primarily based on secondary data. The study further leaves the scope of inclusion of primary data. The inclusion of primary data would have further enhanced the quality of the work accomplished.

Reviewer's Comment 3: The findings of the study are valuable to understand the current state of research in the area from both academia and industries point of view as well as associated challenges and opportunities of blockchain technology.



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Editorial Excerpt



The article has 2% of plagiarism which is the accepted percentage as per the norms and standards of the journal for publication. As per the editorial board's observations and blind reviewers' remarks the paper had some minor revisions which were communicated on a timely basis to the authors (Jyoti, Subodh, Ramesh and Deeksha), and accordingly, all the corrections had been incorporated as and when directed and required to do so. The comments related to this manuscript are noticeably related to the theme "**Customer Centric Blockchain Phenomenon in Global Perspective**" both subject-wise and research-wise. Blockchain technology has the potential to transform a number of areas ranging from the financial sector, healthcare, supply chain management, e-commerce, and retail to the energy sector, etc. The present study discusses the evolution of blockchain and further emphasizes the significance of blockchain from a global perspective. Overall, the paper promises to provide a strong base for further studies in the area. After comprehensive reviews and the editorial board's remarks, the manuscript has been categorized and decided to publish under "**Theme Based Paper**" category.

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