

# Reducing Uncertainty in Trade and Deciphering Future Challenges in Banking Industry Through Application of Blockchain Technology

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## ABSTRACT

Economists have been analyzing human behavior for many years i.e. our reactions in economic decision making individually and/or in groups, how we exchange value, and more. They studied evolution of institutions like legal system, corporations, banks, government, market places, which facilitate our trade by helping in reducing the element of uncertainty. Over many years, these institutions have not only undergone unremitting changes but also evolved dynamically to facilitate exchange of value effortlessly. Today, there is an emergence of a new technological institution which will fundamentally change our perspective of exchanging value and reduce uncertainty. It is referred "blockchain". Though Blockchain is new technology but it is also a continuation of story of human evolution. In the current study, an attempt is made to understand of blockchain technology and its emergence, some useful insight on regulatory challenges on the world wide adoption of this new technology in general and India in particular and finally, the purpose of this article is also to enhance the reader's understanding regarding the challenges to be encountered in future particularly by financial service providers in India due to the disruptions caused by rapid advances in technology.

**Keywords:** Blockchain, Disruptions, Exchanging Value, Regulatory Challenges.

## INTRODUCTION

Economists have been analyzing human behavior for many years i.e. our reactions in economic decision making individually and/or in groups, how we exchange value, and more. They studied institutions which facilitate our trade viz., legal system, establishments, markets, etc. However, there is an emergence of new technological institution which will profoundly transform our understanding of economic exchange. It is referred as blockchain (BC).

As we unearth the human history, we go back to the age when humans were hunters and gathers, we traded only in our village structure. This trade was facilitated with informal rules but violence and social impacts. As our society developed more intricate and our trade route crossed geographies, we started developing more formal set of institutions viz, banks, and government. These institutions managed the risk formerly involved in the exchange of value and individual control started diminishing. Eventually, due to evolution and development of internet, we started putting these institutions online. Online market places started emerging like Amazon, Ebay, Alibaba. All this led to expedite emergence of institutions that act as a middle man to facilitate human economic activities. It was Douglas North, who saw that institutions are the fundamental institutions which facilitate exchange of value lowering uncertainty.

This article enunciates the conceptual framework and outlook of blockchain technology in general and aims to study the following–

- i. To understand theoretical background in working and functioning of blockchain technology.
- ii. To understand methods through which blockchain technology will assist in reducing the level of uncertainty to facilitate more efficient trade.
- iii. To illustrate implications of adaption of blockchain technology on banking industry and level of disruptions in the existing method of banking services.
- iv. To identify few significant challenges which financial industry particularly is going to encounter in future.

**Demystifying Block Chain:** Today we are entering into further and radical era where institution facilitate how we network and trade. Since, it is experienced that uncertainty can be lowered not only with formal

organizations like banks and government, but also with the help of technology. That is where technology like blockchain would provide answers. So, what is blockchain technology?

It is a distributed database network that store record of assets and transactions across a peer to peer network. It is a public record system which automatically records information of ownership and transactions carried out in them. The transactions are secured through cryptography and eventually the transaction history gets locked in blocks of data that are cryptographically linked together and secured. This creates an immutable and unforgeable record of all transactions across this network.

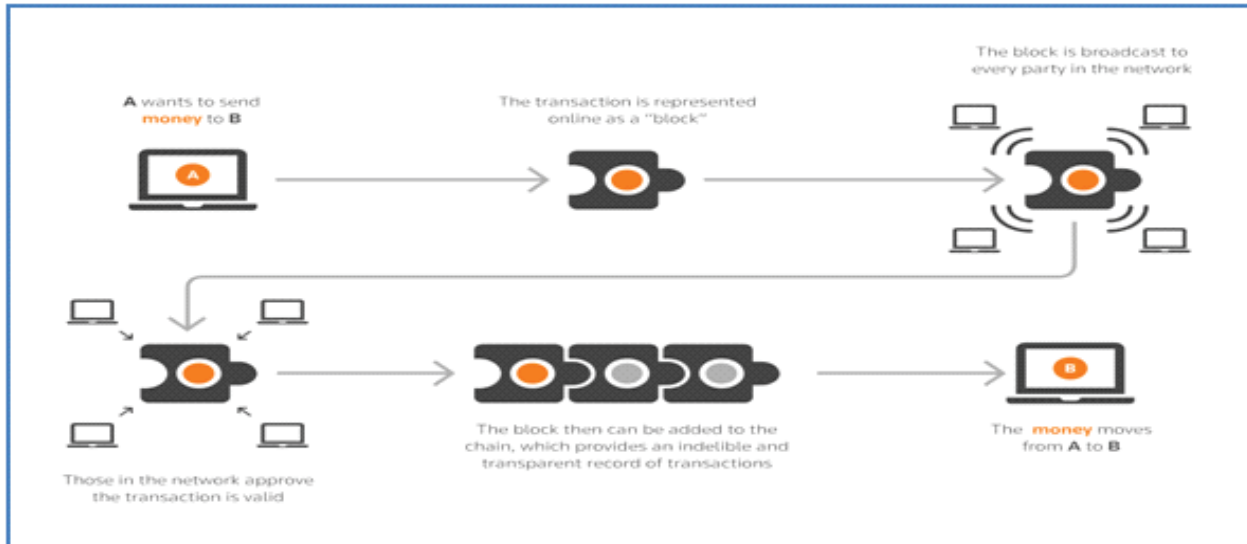


Fig. 1: Demystifying working of Blockchain. Transactions are not recognized until added to blockchain. Any change is immediately visible as everyone in the chain has a copy knowing the change and its source.

Source: Financial Times

That record is replicated on the computers that uses the network [2]. Alternatively, a digital platform is “a proprietary or open modular layered technological architecture that support efficient development of innovative derivatives, which are embedded in a business or social context.”[3] Blockchain can be seen as one such platform. To simplify further, it close explanation is Wikipedia. On Wikipedia, one can not only view all the required information, which is viewed by all, but also change if one wishes to. We can also track those alterations actively on Wikipedia and can create our own wikis because, they mere provide a data infrastructure. Moreover, Wikipedia is an open platform that stores words, images and changes to data overtime. Blockchain, also works like open infrastructure which facilitates storing many kinds of assets. It stores the history of custodianship, ownership and location for assets like digital currency bitcoin, other digital assets like a title of ownership of patent, intellectual property (IP), certificates, legal contracts and even personal information [4].

Reducing Uncertainty :Now question emerges that how blockchain helps in lowering the age old problem of uncertainty and therefore transform our economic systems in radical ways? Blockchain can play a pivotal role in managing uncertainty in today’s life which affects everyone in three ways.

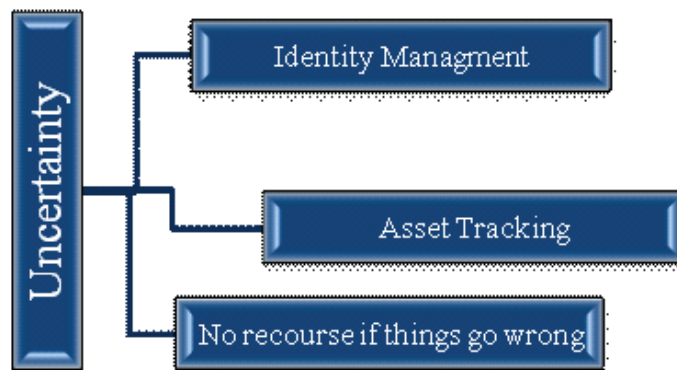


Fig 2: Managing Uncertainty in Everyday Life

**Identity Management :Not knowing who we are dealing with:**

Assume that we wish to buy a refurbished cell phone online. The very first thing is to check from who you are buying this product? Are they good users, do they have good ratings and reviews online, or they do not have any profile at all. Reviews and ratings works as confirmations about our identities that we cobble today and use them to reduce uncertainty about who we are dealing with. However, the problem with reviews and ratings is that they are fragmented (meaning multiple profile). BC allows to build an open platform on which any verifications of any individual/organization from any source can be stored. This type of platform, allows us to create a flexible identity. It works more detailed than a mere profile, and allows selective disclosure of one's attributes to facilitate trade and exchange. For sensitive data or markets for goods which have traditionally been common with fraud, it would make sense to use a blockchain (BC) to assure the user of their reliability [5]. For instance, government issued unique identity (UNID) or that you are over twenty one, by revealing cryptographic evidence that these details exists and are valid. Having such a movable identity not only in physical world but also in digital world will help facilitating trade in totally new way.

**Asset Tracking: Not having transparency in transaction:**

When ordering a cell phone online, one need complete transparency in transaction i.e. we need to know is it the same product what I saw online, how it has been sent and some record that how will it come to us. This is not only particular to electronics goods like cell phones, but also for goods like medicines, luxury items, in-short, all those goods with who we don't wish that any data to be tampered with and is confidential. The issue with many companies who are selling these products online world wide is they are managing numerous vendors across the horizontally supply chain. The manufacturers do not possess the same data base which their vendors are using. Hence, it becomes very cumbersome for the customer to see how that product has evolved overtime. Using BC we can create a common reality across mistrustful entities. By this all of the nodes on the network do not need to know each other or trust each other because each of them will have the ability to monitor and validate the change for them. Referring again example of Wikipedia it is a shared database and even if they have multiple readers and multiple writers at the same time, it has one single reality. So, this implies BC can create a decentralized database that has same efficiency of a monopoly without actually creating the central authority. That means all these vendors and companies can interact using the same data base without knowing one another [6]. For consumers they need to have more transparency as the real world object travels along, they can see the digital certificate or any small move on BC adding value as it goes.

No recourse if anything goes wrong: This is a very open ended uncertainty of our time and renegeing. What if no cell phone is delivered? Can I get a refund? BC allows to write codes which requires contracts between individuals and guarantees that those contracts will be executed with no loss of time and intermediation. One of the example that is payment through an escrow account. The distributor will not get any money till the guaranteed product is not delivered to the customer. This is one of the exciting ways in which BC will lower the uncertainty.

BC would also make economic activities get digital collateralized, automated without any human interventions enabling flow of information from physical world to BC. The question to ponder at this juncture is how to keep it safe? The very thing which keep the BC secured and confirmed is our common disbelief. Consequently, instead of uncertainties hampering us down in our institutions, we can harness all the shared uncertainty and apply it to exchange quicker and open manner.

As BC technology referred by media would provide solutions to all problems, however, we are not sure about that. The fact is that this technology is still new and developing. More work is expected in this field like more experiments and let these experiments not succeed initially, before we recognize suitable use of this technology for our economy. There are many people working on this from financial institutions to technology companies, start-ups and Universities. One of the reason is that it is not just an economic revolution it is also an innovation in computer technology. BC gives us the technological capability of creating a record of human exchange of currency, digital assets, physical assets and personal attributes in a totally new way.

The immediate impact will be seen on the banking industry [7]. The world banking business is more than \$140 trillion. Banking companies are primary institutions assisting the global needs of credit/advances, loans and payments [8]. The commercial banks in India have been involved in performing various functions as necessitated in a developing country. Banks in India have a business model strongly focused on corporate and retail lending, with extensive investment banking business. Exposure to derivatives is significant and the

majority of the off-balance sheet items are unconventional and relatively risky. Keeping pace with the rapid technological changes, these banks are providing value added services using internet, SMS and mobile applications [9].

**Impact on Banking Sector:** The current scenario of Indian banking industry has undergone an overhauling change since last decade and the major contribution to this goes to rapid and unprecedented development in the technology. Financial industry per say has always been very open for integrating such technological changes. Consequently, Indian banking industry has a phenomenal banking reach in unbanked and under-banked area of the country. Banks have been pioneering in harnessing the benefits of technological developments to assist and outreach to the need of their customers. Now a new technology is emerging BC which would fundamentally change the way we used to do banking till now. This BC technology would completely disrupt the basic facilities provided by the banking industry and take it to a new paradigm. Some key business area which would be considerably affected are illustrated –

**Payments:** The two major hurdles which cast apprehensions on existing payment platform are security and transfer cost. BC would provide a faster facility (P2P) of payments at a much lower cost than the existing structure by eliminating the intermediaries which today are required to authenticate transactions among numerous consumer.

**Clearance and Settlement Systems:** In the current system, moving money globally is a big challenge for banks as they have to bypass a complex system of intermediaries before it reaches the final destination. Moreover, this crops more issues like reconciliation and further involvement wider network of intermediateness. BC would result in reducing operational cost, streamlining entire clearance and settlement system through distributed ledgers. This would enable bridging the physical world gap between various financial institutions.

**Fund raising:** BC version of IPO is called initial coin offering (ICO). Projects can sell these coins in exchange of crypto currencies. The value of these coins will be depend on the success of implementation of the project in future. By creating new crypto-economic model of finance BC would provide immediate access to liquidity and long term capital needs from existing traditional financial services.

**Securities:** To transact in financial securities like shares, bonds and commodities in capital markets requires long chain of exchanges, brokers, depositories, clearing houses, etc. By converting financial securities into digital assets and maintaining it in distributed ledgers, BC would revolutionize the traditional structure and operation of capital markets.

**Loans and Credit:** Banks follow a centralized system of scrutiny of loan applications making it hostile for customers. Sometimes, more relevant and qualitative aspects may go oversight in the average credit score of an individual. BC would make borrow loans more secure and at a cheaper interest rate, as it would eliminate hurdles currently existing in the industry.

Thus, BC possesses all the benefits of traditional institutions used the current economic environment, however, in a more advanced and a decentralized manner. This would be executed in such a manner that it would help in converting existing uncertainties into certainty.

### **Future Challenges**

**Development and Applications:** This technology is still been developed as experts and practitioners are apprehensive to applications in real life. Developers are comprehending the mapping benefits accrued from this technology. Any effort to hasty development and application of disruptive technology would not only expose to a different degree of risk but also make the system vulnerable to frauds. Innovators should emphasis on “discrete, actionable ‘first order’ use cases, where only a small number of initial participants is required to gain the necessary critical mass may be commencing with niche applications [10]. Such transformations can be initiated in a phased manner, making valiant transformations in small markets and slender uses in big markets. We cannot rule out the fact that new platforms may help in defining new markets which do not exists today.

**Regulatory Challenges:** Till now, the one block chain applications has received most of the regulatory attention is Bit-coin or virtual currency to be more precise [11]. In this regard, it can be conferred that in case of crypto-currencies, policymakers have made unprecedented momentum enforcing regulations against this different and emerging technology [12]. Many countries have put barriers to entry or made the legal environment so cumbersome that application of new and innovative platforms are finding difficult to enter.

BC would enable to manage to facilitate storage and privacy of data, digital identity validation, peer to peer funding and digital currency [13]. There is a need for the regulators to appraise policies and processes given the greater transparency the BC technology promises.

**Cyber-security:** Much has been told in the past regarding the dangers and risk associated with the cyber-security environment. Initially to accrue the benefits of BC technology, significant commitment of time and resources will be inevitable with relatively modest payoffs in short term. This would pose a major challenge not only for the regulators and policy makers but also to government, defense, and corporate governance [14]. A new emerging technology would need talented and skilled professionals to counter evolving risk and uncertainty.

**Self-Regulation:** Legal codes, laws and regulations can be coded within the digital framework to facilitate automatic implementation and assist the regulators in their attempt to protect the stakeholders. This should also contribute enforcing digital ledgers as evidence which can be accepted by all participants involved in the trade [15]. Self-regulation will become foreseeable in smooth implementation and acceptance of BC technology in India.

## **CONCLUSION**

Deliberated efforts are required not only to emphasize over digital currency (bit-coin) but also discover the potential use of BC technology to empower smarter organizations with application of open, distributed, secure and a low cost technology [16]. This type of technological overhaul would not happen overnight. BC technology is still in nascent stage and experts and practitioners are working on its application to make it perfect for the coming time. Some believe it would altogether replace the existing financial intermediation process while some believe, instead, it would supplement the traditional infrastructure and make it more efficient. Nevertheless, it is believed that it would be the financial industry which would experience this technological disruption and it has already began in many countries. Today there is emerging need to prepare people, organizations, regulators and governments to adapt to the environment of distributed independent institutions as they are the future.

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