



BLOCKCHAIN TECHNOLOGY

Transformation of Business Model through Blockchain Technology

Emon Kalyan Chowdhury

Department of Accounting

CIU Business School

Chittagong Independent University Bangladesh.

Email: emonkalyanchy@ciu.edu.bd

Abstract

Most of the people assume that blockchain technology simplifies only the financial operations. This paper aims to throw light on how blockchain technology influences the overall business process both financial and non-financial to create and deliver value to the clients. The effect of blockchain technology on different blocks of business model has been analyzed considering the famous business model instrumented by Osterwalder and Pigneur. The paper reveals how blockchain technology enables an organization to maximize the interest of stakeholders from different perspectives.

Keywords: Blockchain, Business model, Cost, Revenue, Transparency, Value.

1. Introduction

New technology changes and simplifies our social, economic and business life regularly (Cohen & Amorós, 2014). Blockchain is one of the emerging technologies that are going to bring a paradigm shift in our traditional business model. It ranked fifth among the technology trends in 2018 (Kietzmann, 2019). Though most of the people think, blockchain brings changes only in the financial sectors, it changes the whole business model irrespective of nature, size, and ownership even geographical location of business (Hughes, Park, Archer-Brown, & Kietzmann, 2019). Removing intermediaries is the unique feature of blockchain and business firms which tremendously depend on the intermediaries can enjoy huge benefits by applying blockchain in their business. Blockchain came to scene for the first time with the Bitcoin technology in 2008. The beauty of blockchain is that through cryptography it connects peer-to-peer network technology. This unique feature of blockchain helps to perform transactions between the parties who are unknown to each other and even without the help of so-called intermediary thus

reduces cost as well as save time. It can bring turnaround changes in the field of business ranging from financial services to healthcare. Many organizations and venture capital firms are now investing in blockchain to convert their traditional form business to modern form with strict securities and easy process. Though blockchain started its journey with the bitcoin concept, by this time, it has travelled a significant distance and gradually becoming an important part of all types of businesses.

2. Blockchain Mechanism

It will be beyond imagination to think of any business without blockchain in near future. If transparency is regarded as an essential part of any business, blockchain the only way to ensure it. There are organizations, where control over suppliers and customers cannot be ensured due to geographical distance, business pressure, lack of transparency etc. blockchain can easily help to overcome these problems. Realizing the power of blockchain, giant business organizations such as Nestle, Unilever, and Walmart etc. have already started to use this technology to control the whole supply chain process. Blockchain has application in every aspect of a business. The following figure 1 gives an idea about the scope of its application.

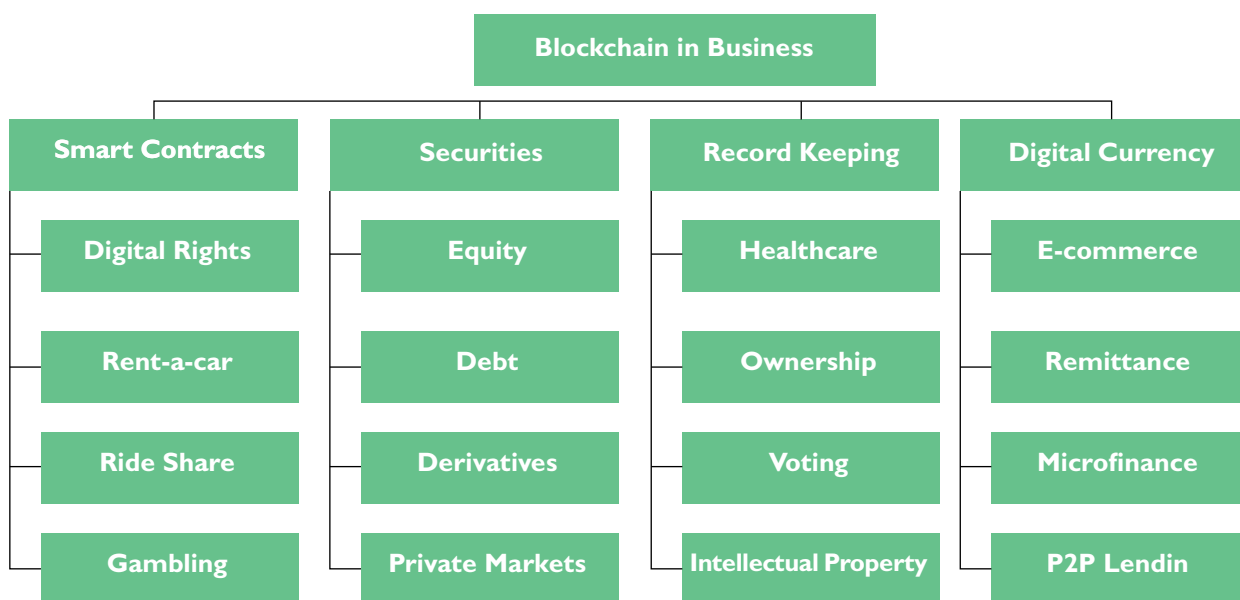


Figure-1: Application of blockchain in business

Source: ACI Worldwide

Smart Contract: Blockchain preserves, verifies and executes codes of smart contracts. These codes are used to do contracts like car or apartment rental, ride sharing, online shopping etc. without intervention of any human being.

Securities: It includes two components: equity and debt. Blockchain helps to issue overstock cryptocurrency bonds with the prior approval of regulatory body. Nasdaq started using blockchain technology to assist investors to keep their records of equity ownership and to reduce settlement time as well as to eliminate the need for paper certificates.

Record keeping: Though record keeping is very complex and tedious task, blockchain can make it so simple by ensuring transparency, detecting counterfeit goods, enabling virtual warranty wallet for both buyers and sellers, modernizing supply chain process, etc.

Digital currency: Blockchain introduced digital currency through bitcoin and reduced the chance of currency frauds to zero level. While no one trusted bitcoin, overstock.com started to accept it for the first time. Although as of now the uses of bitcoin is very low, with the increase of number of bitcoin and incidents like financial calamities, the demand for bitcoin will skyrocket in very near future.

A distributed ledger is used in blockchain where transactions are verified and updated through a network of computers before these are added to the ledger. Here related clients can exchange their respective assets in

real time and undisputable peer-to-peer system without the help of any intermediaries. The exchange of asset through blockchain technology is shown in figure 2:



Figure 2: Exchange of asset using blockchain

Source: Coinmama (2018)

Step 1 : When two parties wish to exchange an asset, the transaction proposal is stored as a candidate and a signal sent to the ledger.

Step 2 : The proposal of transaction contains basic information about clients like name of sender and receiver, date and time of transaction, asset type, quantity and cryptographic signature to ensure authenticity of transaction.

Step 3 : After recording, the signal is transferred to network of distributed computers for processing and authentication.

Step 4 : At this stage, transaction is processed and authenticated.

Step 5 : Recorded transaction is added to the digital ledger.

Step 6 : Finally, the transfer between the clients is completed.

3. Blockchain in Business

Modern business firms can grow rapidly with the help of blockchain technology at the same time it may put traditional business firms in serious trouble if they do not use it. It is essential for a business to establish a culture of creating, delivering and capturing values for the long-term sustainability (Osterwalder and Pigneur, 2013, p. 14). According to them, the sustainability depends on the nine building blocks spreading in to four main areas such as customers, the infrastructure, the offer and the financial viability. The nine blocks are (1) customer segments, (2) cost structure, (3) value proposition, (4) customer relationships, (5) key resources, (6) revenue streams, (7) key activities, (8) channels, and (9) key partnerships. A perfect alignment of these nine blocks can ensure creation and delivery of value as shown in the figure 3 as the business model canvas. The following part focuses on the impact of blockchain on the nine blocks with examples from India, Bangladesh and other countries.

3.1 Customer segments:

It refers to various groups of individuals and organizations that firms target to reach and serve (Osterwalder and Pigneur 2013, p. 20). Blockchain helps organizations to serve the existing customers. Blockchain can be used to segment markets in traditional categories like diversified market, niche market, mass markets etc. Customers who are interested to buy or sell products through online platform like Daraz in Bangladesh and Amazon in India can use blockchain technology. The unique feature of blockchain is that it can help a business to find and access a new customer segment which was not possible earlier (Larios-Hernandez, 2017). PixelCrayons that operates in India and Intelligent Machines Limited in Bangladesh use a permissioned and private Ethereum-based protocol to provide payment services, biometric identity and multicurrency wallet to facilitate medical records and microfinance transactions through a decentralized distributed ledger technology to customers segments.

3.2 Cost structure:

It implies a firm's total costs that are required to run a business (Osterwalder & Pigneur, 2013, p. 40). Blockchain helps to eliminate transaction costs, search costs, negotiation costs, and intermediary costs of a firm. Gregorio (2017) expects that use of blockchain technologies can save \$15 to \$20 billion in the financial services by 2022. DHL courier which operates in all over the world including Bangladesh and India applies blockchain technology to collect, track and deliver their parcels to their valued clients at minimum costs through inbound and outbound transport operations, redesigning global supply chain operations, custom design of warehouses, construction and management of logistic facilities, etc.

3.3 Value proposition:

It means the affords of a firm that create value for customers (Osterwalder & Pigneur, 2013). Theodore Levitt, (1974, p. 8) experienced that customers do not pay for products, rather they pay for a solution. Online food service providing company Food panda in Bangladesh and Bigbasket in India eliminate the problem of a paralyzed person or a mother at home with little kids or even an extremely busy person to order foods or grocery items online that save both time and money as well as give a perfect solution to the problem by using blockchain technology.

3.4 Customer relationships:

It signify the attachment of a company with its different groups of customers (Osterwalder & Pigneur, 2013, p. 27). The purpose is to retain the old customers and to bring new customers under the umbrella. This relation is based on personal assistance, automated service, community establishment, self-service etc. Swapno of ACI and Onestop of Sajeeb Group in Bangladesh and Big Bazaar and Central in India sell varieties of items for different age groups. Blockchain can help these retail chains to keep the records of their age, choices, frequent purchase history etc. to give them alerts on their choices and goods which they never thought of. This system will boost up their turnover to a greater extent.

3.5 Key resources and activities:

Resources are the essential assets which keep a business model functioning. Key resources are financial, physical, intellectual or human and key activities include all activities that are required to ensure delivery of value. Although activities and resources are separate elements, Osterwalder and Pigneur, (2013, p. 34) opined that to deliver value, both should work together. These resources require to redesign for blockchain to ensure a business-friendly model. Firms should not spend too much money on unnecessary space in the warehouse. It can apply just-in-time inventory system with the help of blockchain technology. The areas where public contribution is available, firm should not invest on technology development and implementation. The partial manual system like documentation, verification, auditing should bring under automation system to extract the best benefits from the blockchain application. In the year 2017, Tharigopula Sambasiva Rao executed an agreement with the state government of Andhra Pradesh. He exchanged his six acres of his agricultural land with 6000 square yards of residential plots and

1250 square yards of commercial plots. People who purchased these plots received land documents, certificates entrusted with a QR code from the land registration office within few hours. The whole complex procedure was done so easily by application of blockchain (Quartz India, 2019).

3.6 Revenue streams:

Revenue streams are the cash inflow that a firm gets from the customers (Osterwalder & Pigneur, 2013, p. 30). Revenues come from direct sales and post-sale services. ABI Research (2018) projected that blockchain projects will earn \$10.6 billion by 2023 where a significant portion will come from software sales and services in the form of transaction fees, platform fees, service level agreement for clients etc. (Mearian, 2018). Another important revenue source from blockchain is the initial coin offerings (ICO). A firm can raise funds through ICO by using the crypto currencies and blockchain enabled trading system. Here firms allocate tokens instead of shares to the investors. Subsequently the tokens may be traded in the secondary markets which are verified by blockchain. During the first five months of 2018, total 537 ICOs were offered and \$13.7 billion was raised (PwC, 2018) though it was \$ 5 billion in 2017 with 800 ICOs (CB Insights, 2018).

3.7 Channels:

It indicates different ways like sales team, website, partners, customers, intermediaries through which a company reaches to its customers and deliver a value proposition (Osterwalder & Pigneur, 2013, p. 26). Blockchain simplifies the way of doing business. Intermediaries can be eliminated from the whole process by executing smart contracts between the extreme parties. Montecchi, Plangger, & Etter (2019) observed that innovative channels within and outside the organization strengthen the overall supply channel.

3.8 key partnerships:

Osterwalder & Pigneur, (2013, p. 38) defined partnership as the connection between business and the stakeholders mainly suppliers and partners. Basic forms of partnership are like joint venture, strategic alliance, buyer-supplier relationships. Blockchain eliminates intermediaries between the parties again includes assisting parties like software development kits (SDKs), application programming interface (APIs). However, the following figure 3, shows the impact of blockchain on a firm's business model canvas. A canvas is a tool which helps to present a concept and

its link with other factors in a summarized way.

key partnerships	Key Activities	Value Proposition	Customer Relationships	Customer Segments
<ul style="list-style-type: none"> ■ Strengthen company ties inside the supply chain ■ Shared network ■ Elimination of lengthy processes ■ Strengthen data integrity ■ Facilitation of payments 	<ul style="list-style-type: none"> ■ Transfer business process ■ Peer to peer network 	<ul style="list-style-type: none"> ■ Verifiability ■ Access new products ■ Faster transactions ■ Less expensive ■ Smart contracts ■ Less middle layers 	<ul style="list-style-type: none"> ■ More transparency ■ Self-service ■ Automation ■ No middlemen 	<ul style="list-style-type: none"> ■ Reach new customers ■ Reach new customer segments
	Key Resources <ul style="list-style-type: none"> ■ Verification ■ Documentation audits 		Channels <ul style="list-style-type: none"> ■ New channels ■ New SDKs, APIs 	
Revenue Streams <ul style="list-style-type: none"> ■ Recurring revenues ■ Transaction revenues ■ Service revenues ■ Crowd funding 			Cost Structure <ul style="list-style-type: none"> ■ Reduce search costs ■ Reduce negotiation costs ■ Reduce transaction costs ■ Increased IT/software costs 	

Figure 3: Blockchain and the business model canvas

Source: Morkunas, Paschen & Boon (2019)


4. Limitations and Prosperity of Blockchain Technology

Despite having many advantages of using blockchain, many organizations still cannot think of including blockchain in their strategic process due to few limitations. Schatsky, Arora, & Dongre, (2018) finds the operations of blockchain is slower than traditional process where frequent authorizations are required in a single day. In an organization, where many hierarchies exist, more processing time is added as the data need to be kept confidential (Marvin, 2017). This makes customers less interested about their products and services as customers want quick services. Development of blockchain model is pretty expensive as it requires complex integration efforts. To execute small contracts, prior approval from the regulators is a must. Getting approval from concerned ministry is very difficult in a country like India and Bangladesh due to severe bureaucratic tangles. Since blockchain models are not standardized, it takes huge time and affords to connect the parties who use blockchain in their business. Finally, blockchain cannot work without participation of common users. It is really a challenge to educate people on blockchain who even do not know how to use internet and different easy-going gadgets.

However, Schatsky et al.(2018) observed few recent progress in ease of regulations, partnership development among the business, use of similar blockchain architecture for better reconciliation. Development of Stellar, Hyper ledger, Ripple implementations and R3 has reduced the processing time from minutes to milliseconds (Vukoli, 2018). More than sixty blockchain consortia implementation projects are under construction. These projects will bring together hundreds of public, private and government organizations which are interested to use blockchain (Deloitte, 2018). The implementation cost and operational complexity of blockchain are declining gradually as IBA, Amazon and Microsoft are offering cloud-based implementation solution which is lower than customized models (Patrizio, 2018). Governments of different countries are allowing application of blockchain partially in few selective sectors. Prime Minister Narendra Modi declared that his government would allow the Export-Import Bank (Exim Bank) to do research on distributed ledger and blockchain technology in collaboration

with BRICS economic bloc (Fintech, 2019). Prime Minister of Bangladesh Sheikh Hasina said, Bangladesh will provide necessary budgets to apply blockchain and to train people on this technology to ensure transparency and integrity in financial sector (ATN News, 2019).

Conclusion

There is no doubt that blockchain is a complex mechanism but people do not need to know the whole process in detail. The purpose of this study was to know the impact of blockchain in business model. The whole papers focused on how blockchain technology works and contributes to the development and sustainability of a business. Both public and private blockchain have been discussed with different terminologies to orient reader on this topic. The highly acclaimed business model of Osterwalder and Pigneur (2013) has been discussed in detail to understand how a business can gain in the long-run by delivering value proposition to the clients. Necessary examples have been cited to validate how blockchain technology benefits different organizations in the area of supply chain management, real estate, payment system, currency exchange. Since at present, there is scarcity of data on how blockchain is contributing in Indian and Bangladeshi companies, this clearly opens the opportunity to do research on this issue. However, it was observed that manufacturing companies want to trace inventories from point of purchase to delivery to the client, healthcare units are interested to trace patient records, reduce insurance frauds and pharmaceutical costs, how property development companies want to save time and reduce cost by eliminating intermediaries and speeding up the asset ownership transfer process (Syed, 2018). Finally, although people think blockchain technology is limited to crypto currency only, this paper cleared that it has various applications in a business from different perspectives. 

References

- ACI Worldwide (2017, 20 March), Retrieved from <<https://www.aciworldwide.com/insights/expert-view/2017/march/blockchain-for-retailers-producing-real-business-benefits>>.
- ATN News (2019, June, 14), "Notun Arthobochore Oidhota Pache bitcoin" retrieved from <<https://www.youtube.com/watch?v=GtHLk5dtIIM&feature=youtu.be>>.
- CB Insights. (2018, January 18). Blockchain startups absorbed 5x more capital via ICOs than equity financings in 2017. Available at <https://www.cbinsights.com/research/blockchain-vc-ico-funding/>.
- Cohen, B., & Amorós, J. E. (2014). Municipal demand-side policy tools and the strategic management of technology life cycles.

- Technovation, 34(12), 797—806.
- Coinmama. (2018). What is the blockchain? Available at <https://www.coinmama.com/guide/what-is-the-blockchain>.
- Deloitte. (2018). 2018 global blockchain survey. Available at <https://www2.deloitte.com/us/en/pages/consulting/articles/innovation-blockchain-survey.html>.
- Fintech, (2019), "Will India Emerge as The Next Blockchain Hub of The World?" Retrieve from <<http://fintechnews.sg/28108/india/blockchain-in-india/>>.
- Gregorio, M. D. (2017, February). Blockchain: A new tool to cut costs. PricewaterhouseCoopers. Available at <https://www.pwc.com/ml/en/media-centre/articles/blockchain-new-tool-to-cut-costs.html>.
- Hughes, A., Park, A., Archer-Brown, C., & Kietzmann, J. (2019). Beyond Bitcoin: What blockchain and distributed ledger technologies mean for firms. *Business Horizons*, 62(3), XXX—XXX.
- Kietzmann, J. (2019). From hype to reality: Blockchain grows up. *Business Horizons*, 62(3), XXX—XXX.
- Larios-Hernandez, G. (2017). Blockchain entrepreneurship opportunity in the practices of the unbanked. *Business Horizons*, 60(6), 865—874.
- Levitt, T. (1974). *Marketing for business growth*. New York, NY: McGraw-Hill.
- Marvin, R. (2017, August 29). Blockchain: The invisible technology that's changing the world. *PC Magazine*. Available at <https://www.pcmag.com/article/351486/blockchain-the-invisible-technology-thats-changing-the-wor>.
- Mearian, L. (2018, October 1). Q&A: Walmart's Frank Yiannas on the use of blockchain for food safety. *Computerworld*. Available at <https://www.computerworld.com/article/3309656/emerging-technology/qa-walmarts-frank-yiannas-on-the-use-of-blockchain-for-food-safety.html>
- Montecchi, M., Plangger, K. A., & Etter, M. (2019). It's real, trust me! Establishing supply chain provenance using blockchain *Business Horizons*, 62(3), XXX—XXX.
- Morkunas, V. J., Paschen, J., & Boon, E. (2019). How blockchain technologies impact your business model. *Business Horizons*, 62(3), 295-306.
- Osterwalder, A., & Pigneur, Y. (2013). *Business model generation: A handbook for visionaries, game changers, and challengers*. Hoboken, NJ: John Wiley & Sons.
- Patrizio, A. (2018, March 27). The top 10 blockchain as a service providers. *Datamation*. Available at <https://www.datamation.com/data-center/top-10-blockchain-as-a-service-providers.html>.
- PwC. (2018). Blockchain is here. What is your next move? Available at <https://www.pwc.com/gx/en/issues/blockchain/blockchain-in-business.html>.
- Quartz india <https://qz.com/india/1325423/indias-andhra-state-is-using-blockchain-to-build-capital-amaravati>.
- Schatsky, D., Arora, A., & Dongre, A. (2018, September 28). Blockchain and the five vectors of progress. Deloitte. Available at <https://www2.deloitte.com/insights/us/en/focus/signals-for-strategists/value-of-blockchain-applications-interoperability.html>.
- Syed, N. (2018). Is blockchain technology the future of voting? *Bloomberg*. Available at <https://www.bloomberg.com>.
- Vukoli_c, M. (2018, February 2). Behind the architecture of Hyperledger Fabric. *IBM*. Available at <https://www.ibm.com/blogs/research/2018/02/architecture-hyperledger-fabric>.