

Blockchain for Transforming International Trade: Bangladesh Perspective

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Abstract-- Blockchain is one of the key pillars of the fourth industrial revolution and blockchain become an enormous excitement in many industries including the international trade ecosystem. As we move forward to the fourth industrial revolution, the digitalization of the traditional international trade process is vital. Research on blockchain technology in the field of international trade is very limited. The purpose of this qualitative study is to look at the blockchain application in the field of international trade for Bangladesh perspective. To find out a comprehensive view of blockchain in the international trade ecosystem, in-depth primary interview with relevant stakeholders was taken in addition to analyzing secondary data. The study found that blockchain can transform many parts of the existing international trade process in Bangladesh including customs, trade document management, trade method, payment, transport document, certifications and combating fraudulent activities.

Keywords-- *International trade ecosystem, Digital trade document, Blockchain technology, Decentralized network, Fourth industrial revolution.*

1. Introduction

The emergence of blockchain technology has become a new hype in international trade. Blockchain was the underlining application for functioning Bitcoin. Bitcoin is a cryptographic virtual payment system where parties can transact with each other instead of any trusted third party [48]. Blockchain technology is a cryptographically secured and immutable peer-to-peer distributed ledger which is functioned through a consensus mechanism or agreed among peers [6]. From a business perspective, Blockchain is a central platform without any trusted arbitrator where peers can do transactions to exchange values [6]. Although the application of blockchain was highlighted to facilitate the cryptocurrency of bitcoin but the scope of blockchain application is enormous. In recent times different sectors and industries including international trade are trying to underpin this application.

International trade transactions are complex mechanisms where multiple parties are involved to complete a single transaction [7]. For this, the cost of any international trade transaction is high and the time taken to deliver goods from the manufacturer to the consumer is long [7]. The high cost associated with international trade is also due to the heavy paper-backed process [26]. According to ICC, a typical trade transaction may involve up to 27 documents including 9 possession transfers, may need up to 3 months to process

a transaction with a total of 4 billion document movement in the trade ecosystem, and trade of G7 countries could increase by 9 trillion in five years if the industry becomes fully digitalized [20].

Multiple blockchain-based consortiums are formed to promote digital international trade. One of the blockchain-based trade consortiums is we. trade founded by major banks in Europe which connect buyers, sellers, and banks to simplify international trade and found major benefits like reducing risk, automated transactions and simplifying international trade [46]. So, blockchain technology is seen as a good application to overcome traditional challenges faced by the international trade ecosystem.

To find out the applicability of blockchain technology in the field of international trade few studies have been conducted. However, further study is required to find out a comprehensive picture of blockchain technology in the trade ecosystem. Hence this study will explore prospective areas in the field of international trade where blockchain technology could be effective for Bangladesh's perspective.

2. Literature Review

In January 2009, Satoshi Nakamoto (presumed pseudonymous person or persons), first introduced a peer to peer currency named bitcoin which is a decentralized mechanism having no central authority [27]. Blockchain application which was the feathering application for functioning Bitcoin is considering a dynamic application for many business and industries [47]. In 2013, Vitalik Buterin developed Ethereum which is another blockchain based application apparently perceived as an upgraded version of crypto currency. However, Ethereum is beyond the boundaries of cryptocurrencies and can be used for any peer to peer based computational functioning for any economic layer [11].

In recent days, blockchain application is underpinning in different sectors including the international trade industry. Also, different study is conducted on blockchain technology in various fields to find out possibilities and challenges for implementing blockchain technology. Several study found on exploring blockchain application in the international trade ecosystem.

An overview of blockchain application for international trade was conducted by Belu, 2019. The study highlighted prospective areas in international trade where blockchain application can be used and highlighted potential benefit of using this application. Some of the areas in international trade like: Logistics, payment in international trade, trade finance and document management can be easier and cost

effective. Another study was conducted by Chang et al. 2019, to explore blockchain technology for Letter of Credit process reengineering. Comparative analysis between blockchain based LC processes with the traditional LC process was conducted and feasibility analysis was examined by case diagram and activity diagram [13]. Better used experience and improved process found compare to the traditional LC process. Blockchain technology in foreign trade is explored where electronic document, electronic bill of lading, smart contract in foreign trade are discussed in a paper by Civelek & Ozalp [15]. The study also expected that the total cost and time for foreign trade will be significantly reduced [15]. According to McDaniel & Norberg, Blockchain technology could be beneficial in the field of international trade concentrating on three areas: custom procedure, trade finance and origin of goods traceability [32].

On the other side, study on overall blockchain technology for Bangladesh perspective is very inadequate. One study was conducted to find out digitization effort of land and title management system for Bangladesh on blockchain application [3]. The study found that the overall cost will reduce and digitization effort can be achieved by this blockchain based proposed model [3]. Another study was proposed for the blockchain enabled vehicle registration and information system for Bangladesh perspective [29]. The paper found that the blockchain based vehicle registration system will ensure faster and transparent process for the vehicle registration and information management system [29]. Fertilizer distribution system on blockchain application for Bangladesh perspective was conducted by: Ahmed et al. This study reveals that the blockchain based fertilizer distribution and supply chain process will create strong management information system which will ensure the consistent monitoring and evaluation process [1]. National blockchain strategy for Bangladesh was published focusing the vision of a blockchain enable nation. Fourth industrial revolution will be based on multiple technological pillars and blockchain is considered one of the foundational technology [24].

Several study has been deployed to explore blockchain application in the field of international trade focusing on global perspective. However, to my best knowledge study on blockchain application in the field of international trade for Bangladesh perspective is not explored yet. Hence, the purpose of this study is to explore possibilities and limitations to adopt blockchain technology in international trade ecosystem of Bangladesh.

3. Research Methodology

The study conducted based on qualitative research method. Researcher conduct qualitative research to embrace of multiple relativity [18]. The main idea of qualitative research is to learn about the problem from the participants and use best tools to obtain information from participants [18]. As the aim of this study is to explore blockchain technology in the field of international trade for Bangladesh context, qualitative research being used. Phenomenology strategy was selected for this study. Phenomenological study focus on describing a common concept or phenomenon from several individuals of their

lived experience [18]. The research topic can be broadly divided in two part: one is blockchain and another is international trade. So to explore these two concept from expert people or experienced people who have practical knowledge on these topics phenomenological strategy is being used.

Data collection Method: Both primary and secondary data used for this study.

1. Secondary data: For secondary data different journals, books, news articles and fin-tech websites was explored to find out how blockchain can be facilitate in international trade ecosystem for Bangladesh.

2. Primary data: Unstructured and in-depth Interview conducted both in online and physically for this study. Qualitative interviews generally involve open ended and unstructured questions that are few in number but intended to receive prompt view from the participant [17].

Sampling: Principal stakeholders in international trade transaction are exporter, importer, freight forwarder, warehousemen, carriers, banks, insurer, factors and government agencies [8]. Non probabilistic sample technique was followed as sampling frame for stakeholders in trade transaction are not established. Quota sampling of non-proportionate method used for this study. Quota is used to produce a sample which will reflects population in terms of proportion of different categories like gender, ethnicity, socio-economic group and in combination of these group [10]. The study also, follows snowball sampling: In snowball sampling, researcher initially contact to the relevant group of people of research topic and then use these contact to further establish new contacts which will be included in sampling [10]. This study targeted few initial contact from the relevant trade parties and using their reference further sample had established. For interview purpose, this study divided in few quotas on the basis of concept of blockchain and international trade. From the blockchain cluster, a blockchain expert had selected as a participant for in-depth interview. From international trade cluster, few main parties of trade ecosystem are selected as participant. The study conducted total 9 participants as sample from relevant parties. Dukes (1984), recommended around 3 to 10 participant are good for phenomenology study [18]. In-depth interview was taken from each relevant stakeholder based on following details:

Participant	No of Years
Exporter	20
Importer	11
Trade Bankers	18
Carrier & shipping company	12
CNF agents	13
Custom house representatives	35
Chamber of commerce member	7
Blockchain specialist	4.5
Bangladesh bank personnel	12

Collected in-depth interview data was analyzed manually. Data coding, category analysis and thematic analysis was accompanied to find out the research output for this study.

4. Findings & Discussion

4.1. Blockchain technology in international trade

Recent phenomena: Blockchain is a very recent phenomenon in Bangladesh and only few participants in international trade are underpinning this application at primary stage. Regulatory framework and policy environment are also at infant level for the trade ecosystem.

Decentralized: One of the core concept and the advantage of blockchain technology is the decentralization. There is no need of an intermediaries or middlemen to validate a transaction rather a consensus mechanism is used to agree for a transaction to be completed [6].

Visible and transparent: Visibility is one the main characteristics of blockchain as this application promotes the data sharing on same time to the relevant stakeholders. Information added to the blockchain is immediately visible to the members of the network and members will receive complete copy of data in real time [26]. For example, Walmart with IBM and Tsinghua University track the pork movement from processors to consumers on blockchain which guarantees products origin, quality, information of plants, processing method and details of all steps information [26].

Less Fraud & Forgery: Blockchain ensure just in time operating environment which enables all parties to receive information in real time [34]. As blockchain based trade transaction is visible to the all related stakeholders on real time where fraud and forgeries may be curtailed significantly.

Secure: Blockchain application is secure platform as it based on cryptography and consensus mechanism. So in international trade blockchain application can be used where security is one of the main concern for trade parties. Blockchain can mitigate different financial risk like-settlement risk which arise in glitch of trade settlement process and counterparty risk which arise due to defaulter of trade counterparty before trade settlement [22].

Simplification: Most of the trade transactions are complex in nature due to involvement of different parties. However, blockchain can make easier trade transaction process by integrating different parties on a same platform. Blockchain can serve as a single shared ledger among relevant parties which can simplify the business model by reducing separate systems maintained by each entity [6].

Speed: Trade transaction in blockchain application can be completed very fast and transaction can be completed on real time. The SWIFT network handle 15 million payment order a day from around ten thousand financial institutions globally which takes day to settle them but it will takes around 10 minutes on blockchain based platform [22].

Reduction cost: Trade transactions are expensive as different parties are using their central ledger and different parties are producing same document on behalf of themselves. However, blockchain will share data instantly with relevant parties which will reduce the cost of transaction [34]. According to Spanish bank Santander, if bank can enhance peer to peer value transfer an estimated

of USD 20 billion can be eliminated as back office expense [22].

Digital signature: Hard copy signature is required in almost all parts of trade transaction till today. Digital signature is promising in blockchain application which will transform the traditional wet signatures for trade transactions.

Smart contract: Smart contract is one of the dynamic blockchain based features which refers transaction can be executed automatically once the predetermined conditions are fulfilled. Smart contract are very useful features in trade transaction and available on some new blockchain based platform like: Ethereum, Multichain [6].

4.2. Prospective areas in international trade for adopting blockchain

Letter of credit (LC): LC is the most widely used trade method in Bangladesh. According to BIBM survey data (2016), in terms of cases 59 percent in export and 88.5 percent in import were made through LC method [38]. LC method faces many challenges like old paper based system, physical document exchange and several copies are transmitter by different parties which makes longer process to complete a trade transaction [4]. So, started from LC issuance, LC document checking and LC settlement blockchain could be a great application. Exporter, importer and bank will be benefited by using blockchain application to process LC in real-time by reducing time and cost [4].

Contour is one of the Global networks for corporates, banks and trade partners which was formed in 2018 to



Figure 1: LC in Blockchain application

revolutionize trade industry based on blockchain application. Using the decentralized technology contour transform traditional Letter of credit process maintaining end to end visibility and providing buyer and seller real-time transactional access on a single platform [41]. Traditional LC process can be processed in blockchain based platform like below showed steps in real time:

Open account trade: Open account trade is an arrangement between buyer and seller where goods are produced and delivered before payment is executed and open account is the most popular trade method globally which take place around 80 percent of trade payment transactions [28], [38]. On the other hand, a contrast scenario for Bangladesh where open account transaction is almost absent [31].

However, Bangladesh bank issued circular to address this issue and allowed exporter to ship goods under open account method within some required conditions [5]. One of the main condition of Bangladesh bank is that the risk coverage must be undertaken by any international factoring company, bank, financial institution, financiers or insurance company [5]. Open account transactions are feasible on blockchain where sales contract can be issued on blockchain platform instantly which will be underlining documents for the subsequent transactions. Blockchain based different platform of reputed international financial institutions and bank can address the Bangladesh bank prescribed condition to promote open account in Bangladesh trade ecosystem.

One of the world's first blockchain enabled trade finance and payment consortium is Marco Polo which intend for digital global trade. Marco polo provide open enterprise software to corporations, banks and tech companies for trade finance and payment solutions [44].

Payment: Most of the renowned global banks are already testing the blockchain based payment process. SWIFT platform is widely used for the international trade payment part and SWIFT is also underpinning blockchain based platforms. In 2017, Mastercard introduced blockchain based business to business cross border payment network to improve speed, cost and transparency and user can be access through API which enable user to connect the blockchain network without having their own decentralized ledger server note [26]. In addition, automatic payment process can be possible by the smart contract like-Ethereum blockchain. We.trade is a bank centric blockchain platform build by hyper ledger fabric which can execute automatic payment once all terms and condition are fulfilled set by the parties [46].

In Bangladesh, due to Covid-19 some exporter is struggling to receive payment from some of the troubled western retail brands like- US retail giant JC Penney and British Debenhams [39]. According to Bangladesh Garment Manufacturers and Exporters Association (BGMEA), between April to August of 2020 international buyer suspended, cancelled or demanded unusual deferred payment worth of USD 3.18 billion [39]. So Blockchain based payment platform can be helpful to address this challenges faced by Bangladeshi parties in international trade.

Customs: Customs and ports are very crucial parts in international trade for any country. According to the World Bank, greater corruption is correlated with the greater complexities of customs procedure and which is dominant in the developing countries [32]. The world Custom Organization revealed that the total loss of revenue due to customs related corruption is at least USD 2 [32]. In Bangladesh, despite significant improvement in customs, business is still facing delays and higher cost while passing custom procedure [19]. According to custom and port data, to release imported goods it requires up to 72 hours in 50 percent cases, 72 to 150 hours requires in 38 percent and between 150 to 275 hours are required for rest 12 percent cases [19]. So blockchain application can address this issue to make customs operation more fast and transparent.

Tradelens is one of the blockchain based platform jointly initiated by IBM and Maersk line. Tradelens enable true information sharing and integrating supply chain which can reduce frictions and promote global trade [43]. Transport insight, document sharing, API integration, digital freight management and electronic Bill of lading are some of the service initiated by the tradelens [43]. Pakistan, the first country in the south Asian region joined blockchain based tradelens platform which support customs for export import documentation through secure, paperless and digital solution by combating trade based money laundering [35]. So integration blockchain application in the trade ecosystem will digitalize trade flow and can reduce corruption by increasing transparency in customs procedure.

Certifications and inspections: Different chamber of commerce and organizations normally issues certificates for their members which could be issued on blockchain application. In addition, inspections from third party company and government authority is required for may trade transactions which also can be produced in blockchain platform. World's first blockchain based certificate of origin was implemented by vCargo Cloud and found major improvement on transparency, security and verification of trade documents [42]. So, to export from Bangladesh and to import in Bangladesh blockchain based certifications can be useful. To illustrate, if Bangladeshi chamber or authority incorporate blockchain based platform then all related parties could be beneficial by issuance of digital certificates through below mentioned process:

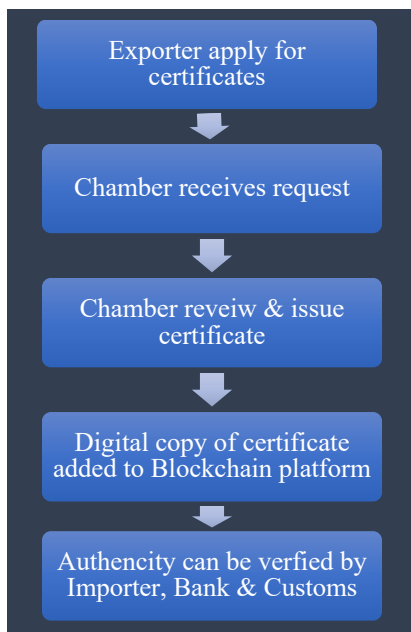


Figure 2: Certifications in Blockchain application

Digitize trade document: Hardcopy document is required in most all phase of international trade. For this, lengthy process need to follow for any international trade transaction and cost associated with trade transaction is also high. In global trade, paper is a barrier for smooth business operation resulting high cost, high risk of forgery and annual lose over USD 19 trillion in goods [25]. In addition, green banking initiatives is hindering due to heavy paper based transactions. A study to compare emissions generated by paper invoices with digital e-invoices at a Finnish logistics services was conducted and found 63 percent reductions in greenhouse gas emissions per invoice [40]. So Trade ecosystem is far more complex and are involved more paper based documentations other than only invoices.

Currently global trade value is more than USD 18 trillion per year and due to paper based and manual document handling procedure reduces additional increase of 15% [43]. However, digitization in trade can increase of USD 1.8 trillion per year and USD 5.2 trillion by 2050 [43]. So blockchain can digitize the traditional paper backed process and can tap the prospect of trade value increments.

Fraudulent activities: As most of the part of any international trade transaction is manual which the cause of fraud and forgeries. Falsified information from both exporter and importer end including money laundering are hindering the legal trade transaction flow. As per ICC survey 2016, 18.5 percent responded for increase number of fraud, 16.1 percent experienced increased number of court injunctions in bank payment undertaking and 34 percent reported increasing refusal rate on first document presentation in trade [38]. In recent times, Money laundering and breaching sanctions are becoming alarming in trade. According to Global Financial Integrity (GFI),

more than 49.6 billion USD moved from Bangladesh through trade based illicit financial flows between 2009 and 2015 [45]. Blockchain can be helpful by strengthening beneficial ownership and client identity more effectively [33]. Blockchain based KYC will enhance transparency of transactions which can play significant role to prevent money laundering [2]. Hence, blockchain technology can be useful to reduce money laundering, fraud and forgeries as transaction will be digital, validate by all parties, documented and cannot be altered easily.

Document management: International trade required different types of document to complete a single transaction. For instance: Exporter, importer, bank, carrier and government body issued commercial, transportation, trade financing and regulatory documents from their end. In Bangladesh, some of the widely used trade document are: export-import license, sales contract, commercial invoice, LC, certificate of origin, Phyto-sanitary certificate, Bill of lading, insurance policy, custom declaration. Most of these document is prepared and handed over in paper based. However, multiple trade documents can be easily produced and shared in blockchain application on real time which are currently processed in paper based.

Globally, to manage trade document many blockchain based platform already introduced. Essdocs is one kind of web based document hub for paperless trade which enables to create, review and transfer digital document in trade ecosystem [23]. CargoX, is another blockchain based platform which enable members to create and transfer original trade document by ensuring security, reducing time and cost [12]. So blockchain based trade platform could be helpful to create, manage and transfer multiple trade document in a virtual environment.

Transport document: Transport document is one of the vital shipping documents used in international trade. One of the widely used transport document is Bill of Lading which is a title of goods and issued in paper based till today. In addition, hand to hand courier transmission of bill of lading is pricey, slow, risky, exposed to forgery and document lose [21]. However, Transport document including Bill of Lading can be issued and shared with relevant parties in blockchain application.

Bolero is one kind of blockchain based trade consortium which promotes blockchain based electronic bill of lading. Using API, eBL service solutions provide managing of eBL notifications, amendment, title transfer, surrender and switch to paper [37]. Blockchain based Bill of Lading (eBLs) instead of paper based Bill of lading can reduce fraud, delays, loss, risk, and high cost in trade transactions [21]. For example, if trade transaction is route in blockchain based consortium where related parties such as Shipper, carrier, shipper bank, buyer bank and buyer will receive, endorse and transfer BL instantly like below presented consortium:

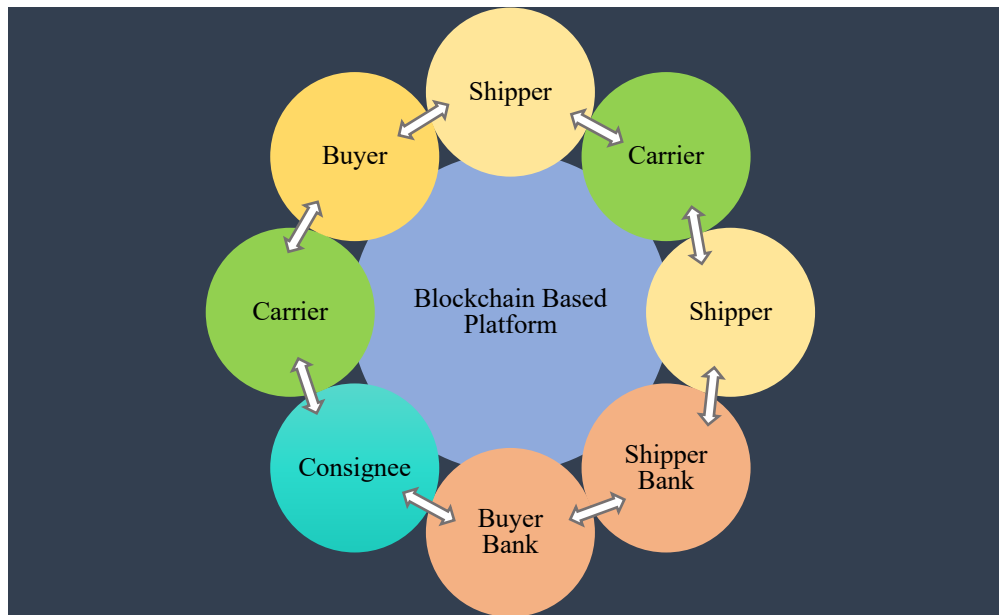


Figure 3: Bill of lading in Blockchain application

4.3. Blockchain initiatives in Bangladesh

4.3.1. Initiative taken by Government & policymaker

Information & Communication Technology (ICT) division, government of Bangladesh has taken numerous initiatives including infrastructure development to promote fourth industrial revolution and blockchain is considered as one of the pillar of those initiatives. In addition, International blockchain Olympiad was organized by the ICT and Bangladesh Computer Council (BCC) [30]. National blockchain strategy which is the first effort from the government of Bangladesh regarding blockchain technology has been initiated in focusing the fourth industrial revolution. However, no comprehensive and steps by steps guideline provided focusing on international trade transaction by this strategy. To achieve Sustainable Development Goals (SDG) by 2030 many countries around the world have started exploring blockchain technology and unfortunately Bangladesh is lagging behind [24]. Although Bitcoin and other crypto currency are not permitted by Bangladesh bank, policy maker seems positive regarding blockchain technology in recent days. However, to implement blockchain technology in the trade transactions a comprehensive guideline and framework for relevant stakeholders is required by the Bangladesh bank and other policy maker.

4.3.2. Initiative taken by stakeholders

Blockchain technology for international trade transactions is not tested by the most of stakeholders in Bangladesh till now. However, Bank as one of the main participant already explored this application in the trade transactions and few parts of those transactions are highlighted below:

I. Standard chartered bank completed Bangladesh first blockchain based LC transaction for Viyellatex group on contour platform [16].

Mr K.M. Rezaul Hasanat, Chairman and CEO of Viyellatex Group said: “Blockchain technology will certainly increase trading efficiency and reduce turnaround time of the LC process” [16].

II. HSBC completed first ever cross boarder LC transaction in Bangladesh for import of fuel oil from Singapore by United Mymensingh Power Limited Bangladesh and transaction time was reduced from 5-10 days to 24 hours [9].

Md. Mahub Ur Rahman, Chief Executive Officer, HSBC Bangladesh said: “I believe this will usher in a new era of routing international trade transactions as businesses and governments recognize the transparency, security and swiftness in performing tasks using Blockchain technology” [9].

Mr. Moinuddin Hasan Rashid, Group Chairman and Managing Director, United Group said: “Fuel Oil LCs are highly time sensitive where every second counts and we believe this Blockchain technology will help to manage time efficiently and also ensure increased efficiency and better cost management” [9].

III. City Bank has executed the first-ever cross-border Shariah-based blockchain LC transaction in Bangladesh, which reduce LC processing time from 24-72 hours to 38 minutes [14].

IV. Prime bank is the first Bangladeshi bank to execute interbank blockchain LC transaction partnering with HSBC and Contour platform [36].

Sharif Zahir, Managing Director of Ananta Group said: “Compared to paper based LC system, it took very short time to complete the entire process of LC initiation to document submission to acceptance, ensuring all the standard formalities of trade [36].

Alam Chowdhury, Director of Tamishna Group said: “We have seen that the COVID-19 pandemic has led to an unprecedented push towards digitalization in all sectors. It

is high time that international trade also breaks away from paper based trade and move towards trade digitalization. Etafil Accessories Limited (Tamishna Group) is proud for historic blockchain LC transaction” [36].

4.4. Future policy required to adopt blockchain

As per primary in-depth interview, participant suggests following initiative need to address to adopt blockchain application in trade ecosystem in Bangladesh:

Infrastructure: Timely policy, skills enhancement and coordination among stakeholders in trade ecosystem can create a good infrastructure for implementing a new technology like blockchain. Bangladesh bank, Bangladesh customs, Nation board of revenue, ministry of commerce and other policy advocators can develop short term and long term strategy to create a sustainable infrastructure for blockchain implementations.

Disseminate knowledge and ideas: Fundamental knowledge about blockchain and blockchain based new business model need to disseminate among the international trade parties to find out prospective areas of blockchain application. Seminars and corporate workshop could be helpful to disseminate blockchain knowledge and ideas among stakeholders of international trade ecosystem.

Skills development: As blockchain is a new phenomenon, sufficient expert of blockchain application is not currently available in Bangladesh. So to create adequate blockchain expert pool like: blockchain developer, blockchain application specialist, blockchain governance, timely skills enhancement need to initiate by policymaker and participate member from trade ecosystem. In addition, upskilling of relevant parties and reskilling of existing employees from relevant trade parties are needed to develop.

Research and study: Blockchain related study and research is required and for this academia and industry can jointly take initiatives. For educational institutions, blockchain related content need to be included in different relevant engineering and business degrees. For industry, it is important to sponsor on academic research for innovation and blockchain based research could be rewarding for the trade industry in Bangladesh. In addition, government in partnership with academia and industry can create a good infrastructure for the capacity development for Bangladesh.

4.5. Blockchain implementation challenges in Bangladesh

New phenomena: Blockchain is a new concept for the international trade ecosystem in Bangladesh and promoting blockchain based new business model will be challenging. Also till now most of the parties of trade ecosystem are not showed adequate interest about blockchain in Bangladesh. In addition, one of the main challenges of large scale blockchain implementation is lack of knowledge regarding blockchain and its potential benefit among the private and public organizations in Bangladesh [24].

Few banks are implementing: As of today only four banks in Bangladesh implemented blockchain technology

in limited scale only for LC related trade transactions. Also, other major stakeholders in trade ecosystem like: Customs, CNF agents are not testing this application till now. So most of the banks operating in Bangladesh and most of the stakeholders in trade ecosystem are not underpinning this technology yet.

Diverse platform: Different country and organization do have different types of application to do business and integrating those platforms in a single blockchain based network will be a hard task for Bangladesh. Interoperability is a major concern in international trade as trade transaction can touch various system from bank to logistics and development of interoperability is very important to avoid future disputes among different stakeholders. [26].

Security concern: Blockchain is considered as a secure platform by its nature, still there are multiple issues associated with this application and many stakeholders in international trade are concerned about this. Private blockchain is secured as everyone is not able to get access the platform but who has the access will receive all data unless special measurement are take place [24]. Although consensus mechanisms of blockchain ensure that one node is not able to complete the fraudulent activity but hacker able to corrupt the transaction once hacker able to control major nodes of a platform [32].

Lack of regulations: Public blockchain is governed by the philosophy of the open source application and public governing body is responsible for governing the system but private blockchain do have authorized entities with a common aim [24]. In many countries including Bangladesh, rules and regulations from the government side are at infant level. The development of wide scale blockchain application in trade ecosystem requires legal status of blockchain based transaction and without development of regulatory framework blockchain application will be limited only pilot project [26]. Although Bangladesh, banned usage of cryptocurrency and bitcoin, blockchain domain is considered to be strong disrupting capabilities [24]. So proper regulatory framework and policy is needed to develop a comprehensive and timely blockchain based international trade ecosystem in Bangladesh.

Difficulties in shifting ecosystem: Shifting from the existing business process into the new blockchain based ecosystem do have several challenges. Many stakeholders may be reluctant to adopt the new technology into their existing business model.

5. Limitations of the study

This study is conducted based on secondary available data and a limited number of qualitative interviews from the trade ecosystem in Bangladesh due to time constrain. So this study may suffer adequate reliability and robustness. Also, no quantified comparison is done with the blockchain-based trade transaction and traditional transactions which shows the future research scope of quantitative research. In addition, implemented blockchain-based consortium in Bangladesh can be taken as a case in future research which is not studied in this paper.

6. Conclusions

Blockchain technology is experiencing and testing in various fields including the international trade ecosystem. Few blockchain based projects already underpinned in Bangladesh; however, study on blockchain-based trade ecosystem in Bangladesh was not explored yet. Hence, this study aims to find out whether blockchain-based international trade ecosystem is viable for the Bangladesh context conducting qualitative research approach. This research reveals that introducing blockchain applications in the trade will reduce cost, time and improve the security in different parts of the trade ecosystem. Blockchain can transform the traditional trade process, procedure and practices including trade method, customs involvement, regulatory supervision and trade document management. Letter of credit (LC), open account trade, Trade financing, trade payment, inspections, certifications, transport documents are major areas where blockchain has ample scope to disrupt. However, disseminating and implementing blockchain technology in the trade ecosystem will require sufficient skilled people, technological infrastructure, stakeholder's engagement and timely policy.

References

- [1] Ahmed, S., Islam, M. E., Hosen, M. T., & Hasan, M. H. "Blockchain based fertilizer distribution system: Bangladesh perspective". In Proceedings of the International Conference on Computing Advancements, pp. 1-5, (January, 2020).
- [2] Akhtar, M. S. "Block Chain as Anti-Money Laundering Service". ILMA Journal of Technology & Software Management, 1(1), (2020).
- [3] Alam, K. M., Rahman, J. A., Tasnim, A., & Akther, A. "A Blockchain-based Land Title Management System for Bangladesh". Journal of King Saud University-Computer and Information Sciences, (2020).
- [4] Al-Amaren, E. M., Ismail, C. T. B. M., & Nor, M. Z. B. M. "The blockchain revolution: A game changing in letter of credit (L/C)". International Journal of Advanced Science and Technology, 29(3), 6052-6058, (2020).
- [5] Bangladesh Bank. FE Circular No. 25. Date: 2020, June 30 Retrieved from Bangladesh Bank Web site: <https://www.bb.org.bd/mediaroom/circulars/fepd/jun302020fepd25e.pdf>.
- [6] Bashir, I. "Mastering Blockchain." Packt Publishing Limited, Birmingham, (2017).
- [7] Belu, M. G. "Application of blockchain in international trade: An overview". Romanian Economic Journal, 22(71), 2-15, (2019).
- [8] Bishop, E. "Finance of international trade". Butterworth-Heinemann, (2004).
- [9] Blockchain for Trade Finance. Retrieved from HSBC Web site: <https://www.business.hsbc.com.bd/engb/innovation-digital-transformation/blockchain-for-trade-finance>, (15-01-2022).
- [10] Bryman, A., & Bell, E. "Business Research Methods". Oxford: Oxford University Press.
- [11] Buterin, V. "A next-generation smart contract and decentralized application platform". White paper, (2014).
- [12] CargoX for Transport and Logistics. Retrieved from CargoX Web site: <https://cargox.io/solutions/for-transport-and-logistics>, (23-12-2021).
- [13] Chang, S. E., Chen, Y. C., & Wu, T. C. "Exploring blockchain technology in international trade: Business process re-engineering for letter of credit". Industrial Management & Data Systems, (2019).
- [14] City Bank Executes First Ever Cross-border Shariah Based Blockchain LC Transaction Partnering with ITFC. Retrieved from The City Bank Web site: <https://www.thecitybank.com/newsevent/city-bank-executes-first-ever-cross-border-shariah-based-blockchain-lc-transaction-partnering-with-itfc> (12-01-2022).
- [15] Civelek, M. E., & Özalp, A. "Blockchain technology and final challenge for paperless foreign trade". Eurasian Academy of Sciences Eurasian Business & Economics Journal, 15, 1-8, (2018).
- [16] Contour facilitates first blockchain Letter of Credit in Bangladesh. Retrieved from Contour Web site: <https://contour.network/press-release/contour-facilitates-first-blockchain-letter-of-credit-in-bangladesh>, (23-12-2021).
- [17] Creswell, J. W., & Creswell, J. D. "Research Design Qualitative, Quantitative, and Mixed Methods Approaches". SAGE Publications, Inc., (2018).
- [18] Creswell, J. W., & Poth, C. N. "Qualitative Inquiry & Research Design: Choosing Among Five Approaches". SAGE Publications, (2016)
- [19] Customs delay bites Bangladesh businesses. Retrieved from The Financial Express Web site: <https://www.thefinancialexpress.com.bd/economy/customs-delay-bites-bangladesh-businesses-1612752660>, (15-01-2022).
- [20] Digitalization could add US\$9tn to G7 trade by 2026, says ICC. Retrieved from Global Trade Review Web site: <https://www.gtreview.com/news/global/digitalisation-could-add-us9tn-to-g7-trade-by-2026-says-icc/>, (15-01-2022).
- [21] Digitization with Electronic Bills of Lading. Retrieved from WAVE BL Web site: <https://wavebl.com/the-full-guide-to-bills-of-lading/#chapter-1>, (19-01-2022).
- [22] Don Tapscott, A. T. "Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World". Penguin Publishing Group, (2018).
- [23] EssDOCS Paperless Trade Solutions. Retrieved from Essdocs Web site: <https://www.essdocs.com/solutions/cargodocs/dochub>, (11-01-2022).
- [24] Ferdous, M. S., Sultana, J., Reza, M. S., & Ahmed, S. "National Blockchain Strategy: Bangladesh" (2020).
- [25] Frictionless Digital Document Exchange. Retrieved from WAVE BL Web site: <https://wavebl.com/solution/>, (11-01-2022).

- [26] Ganne, E. “*Can Blockchain revolutionize international trade?*” Geneva: World Trade Organization, (2018).
- [27] Ghimire, S., & Selvaraj, H. “*A survey on bitcoin cryptocurrency and its mining*”. In 2018 26th International Conference on Systems Engineering (ICSEng) (pp. 1-6). IEEE, (2018).
- [28] Habib, S. M. A., & Shah, P. “*Trade Service Practices in Bangladesh—an Analysis*”. International Journal of Trade, Economics and Finance, 8(2), 117-122 (2017).
- [29] Hossain, M. P., Khaled, M., Saju, S. A., Roy, S., Biswas, M., & Rahman, M. A. “*Vehicle registration and information management using blockchain based distributed ledger from Bangladesh perspective*”. In 2020 IEEE Region 10 Symposium (TENSYP) (pp. 900-903). IEEE, (2020)
- [30] International Blockchain Olympiad starts tomorrow in Bangladesh. Retrieved from The Financial Express Web site: <https://thefinancialexpress.com.bd/education/international-blockchain-olympiad-starts-tomorrow-in-bangladesh-1633607382>, (18-01-2022).
- [31] Making Open Account transaction secure. Retrieved from The Financial Express Web site: <https://thefinancialexpress.com.bd/views/making-open-account-transaction-secure> (19-01-2022).
- [32] McDaniel, C. A., & Norberg, H. C. “*Can blockchain technology facilitate international trade*”. Mercatus Research Paper, (2019).
- [33] Naheem, M. A. “*Exploring the links between AML, digital currencies and blockchain technology*”. Journal of Money Laundering Control, (2019).
- [34] Alfayad, F. S. “*Reducing just-in-time delivery related cost volatility in the global supply chain: Consumers and blockchain technology*”. International Journal of Supply Chain Management, 9(3), 963-972. (2020).
- [35] Pakistan customs joins tradelens as the first authority in the region to intensify efforts in digitizing supply chains. Retrieved from Tradelens Web site: <https://www.tradelens.com/post/pakistan-customs-joins-tradelens>, (18-01-2022).
- [36] Prime Bank becomes the first Bangladeshi Bank to execute interbank blockchain LC transaction. Retrieved from Prime Bank Web site: <https://www.primebank.com.bd/index.php/home/news/40>, (18-01-2022).
- [37] Safer, smarter and faster global trade. Retrieved from Bolero Web site: <https://www.bolero.net/company-overview>, (15-12-2021).
- [38] Shah, A. “*Trends and Challenges of Trade Services by Banks: Bangladesh Context*”. Available at SSRN 3021934, (2017).
- [39] Some RMG suppliers struggling for export payment. Retrieved from The daily star Web site: <https://www.thedailystar.net/business/economy/news/some-rmg-suppliers-struggling-export-payments-2936691>, (15-01-2022).
- [40] Tenhunen, M., & Penttinen, E. “*Assessing the Carbon Footprint of Paper vs. Electronic Invoicing*”, (2010).
- [41] The future of global trade a single global network. Retrieved from Contour Web site: <https://contour.network/trade-finance-solutions/#technology>, (23-12-2021).
- [42] Trade Facilitation Platform. Retrieved from vCargo Cloud Web site: <https://www.vcargocloud.com/our-solutions/trade-facilitation-platform/#>, (20-01-2022).
- [43] Trade Made Easy. Retrieved from Tradelens Web site: <https://www.tradelens.com/>, (18-01-2022).
- [44] Trade Pay Grow. Retrieved from Marco Polo Network Web site: <https://marcopolonetWORK.com>, (15-01-2022).
- [45] USD49.65b siphoned off from Bangladesh in six years: GFI. Retrieved from The Financial Express Web site: <https://thefinancialexpress.com.bd/trade/4965b-siphoned-off-from-bangladesh-in-six-years-gfi-1639797327>, (18-01-2022).
- [46] we.trade. Retrieved from IBM Web site: <https://www.ibm.com/case-studies/we-trade-blockchain>, (15-01-2022).
- [47] Yli-Huumo, J., Ko, D., Choi, S., Park, S., & Smolander, K. “*Where is current research on blockchain technology? —a systematic review*”. PloS one, 11(10), e0163477, (2016).
- [48] Nakamoto, S. “*Bitcoin: A Peer-to-Peer Electronic Cash System-Satoshi Nakamoto*”. The Bitcoin Whitepaper.