Original Research Article

EXAMINE THE FEASIBILITY OF IMPLEMENTING BLOCKCHAIN TECHNOLOGY IN THE SRI LANKAN BANKING SYSTEM

Abstract

In the era of digitization, it is important that Banks and Financial institutions stay up to date with the latest technology. Blockchain technology is one such technology which has become a widely discussed topic when it comes to finance in the digital era. The objectives of this study are to identify the factors that affect Blockchain adoption as well to identify the possible applications of it in the Sri Lanka banking sector. The study applied qualitative research approach. An interview guide was created and banking professionals were interviewed in order to understand their take or perception on Block Chain implementation in the Sri Lanka Banking sector. This study discovered that the application of Blockchain technology for shared KYC, trade finance, and Central Bank Digital Currency (CBDC) was possible. When deploying Blockchain technology, interoperability problems, regulatory limits, and lack of knowledge were the main obstacles. Additionally, the presence of Fin Tech companies, the regulator's attitude, the cooperation of banks, customers' perceptions, and the banking system's capability functioned as catalysts to enable such an adoption. The results and suggestions of this study would benefit bankers, educators, and practitioners in their efforts to examine the factors that affect the adoption of Blockchain technology. It will also help them to develop workable solutions for their problems. This will also help authorities like the Central Bank in order to create a proper framework for the implementation of block chain technology in the Sri Lanka banking sector. The study will contribute to extend the existing literature on Blockchain adoption and that it will help to create the much-needed framework in order to successfully implement Blockchain technology in banking system while set precedence for future research on this area.

Keywords: *Blockchain technology; Fin Tech; Shared KYC; Central Bank Digital Currency; Trade Finance*

1. Introduction

Blockchain is a continuous and sequential chain of data "blocks". The invention of Blockchain has tested the boundaries of technologies such as the Internet of Things (IoT) and artificial intelligence (AI) while even exposing several negative aspects of digitization, such as the phenomenon of techno stress. Blockchain, today, has permeated almost all sectors across the globe and thereby has created windows of opportunities throughout the economic value chain to enhance business processes in terms of productivity (Iyer et al, 2022). Block chain technology is endless as it can be used in different industries and domains such as IOT, Energy, Health care, public administration, supply chain management and especially in the fields of Finance and Banking (Jaoude & Saade, 2019).
In the current context, the banking system is interconnected via networks such as the Society of Worldwide Interbank Financial Telecommunication or SWIFT which facilitates the flow of data and information. Accordingly, technology has been well-integrated into the operations of the banking sector, and Blockchain is expected to be the next rung in the

ladder for technical adaption and expansion of services in banks – both locally and globally (Khadka, 2020).

The economic slowdown and resultant recessionary fears across global economies – which was triggered by the pandemic in 2020 has caused a surge in demand for alternative methods of Finance and many scholars have conducted research on the concept of Block Chain technology within the Finance and Banking sector (Chris, 2021). Moreover, agencies such as Deloitte have shown interest in Blockchain and its implementation, having conducted a survey of 1,000 banks across the world to determine the willingness of these banks to implement the technology in their operations. A few banks, like HSBS and the Bank of England, have started talking about possibly implementing blockchain technology; a digitized version of the Sterling pound was also mulled by the Bank of England. The Bank of England, in 2019, also conducted a proof-of- concept assessment of the impact Blockchain could have on the real-time gross settlement system (Chris, 2021).

As discussions have commenced all around globe on this promising area, even developing countries like Sri Lanka have also begun discussions. With the assistance from significant financial institutions, groups, and even universities in Sri Lanka, the Central Bank of Sri Lanka (CBSL) had carried out its own proof of work relating Blockchain Technology. The University of Colombo School of Computing (UCSC), Sampath Bank, Yaala Labs (Pvt) Ltd, and Norbloc AB from Sweden were the three applicants previously chosen by the CBSL to construct the Proof of Concepts (POC's). Amana Bank, Bank of Ceylon, Cargills Bank, Commercial Bank of Ceylon, DFCC Bank, Hatton National Bank, HSBC, National Development Bank, People's Bank, and Standard Chartered Bank were among the ten commercial institutions that tested the POCs along with the CBSL. In June 2021, the POC testing and deployment phase was successfully finished. The research unveiled several secure features of Blockchain that made the transfer of confidential client KYC data in a secure and effective manner. In fact, the CBSL spearheaded a ground-breaking national initiative that attracted the willing involvement of the banking and IT industries to jointly study the possibilities of blockchain technology to enable innovations in a variety of financial services (Central Bank of Sri Lanka, 2021).

As such studies and experiments are being conducted regarding Blockchain Implementation within Sri Lanka, the most challenging aspect of implementing Block Chain Technology within Sri Lanka is the fact that there is no proper regulatory or central authority to deal with matters related to Block Chain Technology. There by it has been quite challenging for institutions to adopt Block Chain Technology within the country. The biggest concern for the professionals has been the fact that there are no laws or regulations related to cryptocurrency as of yet but there are hope full that in the near future such regulations will come to place. Under such circumstances it is vital that we conduct more and more researches on the possible adoption of Block Chain technology in order to properly understand the key variables, drivers as well as Barriers for Block Chain Technology within the Banking Sector. Given the crucial role banks play in the Sri Lankan economy, the adoption of blockchain must be on par with the international market.

The main purpose of this study is to examine the feasibility of implementing a blockchain within the Sri Lankan banking sector. As a specific objective this research investigates the attitudes and perception that banks and professionals have regarding implementation of blockchain technology within banks of Sri Lanka. As such, this study aims to address the following research questions:

1. What are the supporting factors that will help the adoption of Block Chain Technology in the Sri Lanka banking sector?
2. What are the challenges faced by banks in Sri Lanka when implementing Blockchain Technology?
3. What are the possible applications of Block Chain Technology in banking sector in Sri Lanka?

Understanding the barriers of blockchain adoption and the potential benefits of blockchain adoption will immensely benefit bankers, educationists, practitioners as they will be able to analyze these factors on a deeper level and come up with effective solutions for those challenges. The regulators such as the Central Bank also will benefit as they will be able to formulate and modify policies to support the adoption of blockchain technology. Banker will be able to use the findings of this research in order to look at the supporting factors for Block Chain Technology implementation and strengthen these factors more. This study will also set precedence for future research while creating more awareness on Block Chain Technology and will be able to contribute to the existing knowledge on Block Chain Technology. Most importantly by analyzing this study the regulator or the Central Bank could set up a proper plan on how to implement this technology while at the same time determine on how this technology should be properly regulated as this study will help in setting up those much-needed standards and protocols.

This paper is structured as follows. Section 2 provides the literature background. Section 3 describes the methodology. The empirical results and discussion are reported in Section 4, and Section 5 concludes the paper.

2. Literature Review

2.1 Blockchain technology

Blockchains can be defined as a distributed (i.e., without a centralized database) and typically decentralized (i.e., not controlled by a bank, enterprise, or government) tamper-evident and tamper-resistant digital ledgers. At their most basic level, they allow a group of users to record transactions in a shared ledger so that, as long as the blockchain network is functioning normally, no transaction can be modified after it has been recorded (Yaga et al., 2019). It is crucial to note that there are essentially two categories of blockchains: permissioned (private blockchains) and permissionless (public blockchains) (i.e., private and consortium blockchains). The two kinds of blockchains are comparable in certain ways (e.g., a cluster of nodes functioning on a P2P network system, time stamping of transactions, immutability). However, there are differences in the number of network nodes and the consensus procedure for validating and recording transactions (Toufaily et al., 2021).

There is also another classification as Public and Private Blockchains. Blockchains that are open to the public, allowing anybody to read and add transaction are known as public Blockchains. As for a Private blockchain is where users within a single organization or a collection of organizations are the only ones who can use this permission. While most permissioned blockchains aim to limit data access to the organization or group of companies that runs the blockchain, in practice most permissionless blockchains offer public access (Peters & Panayi, 2016). All forms of blockchains benefit from

decentralization to varying degrees, which reduces the risk of a single point of failure and improves data integrity (Viriyasitavat & Hoonsopon, 2019).

The use of blockchain will change the way we think about business management, finance industry, and other related fields. Through customization, this would aid in the speedy resolution of disagreements. This will reduce the significant amount of manual labor that financial services organizations currently perform. To assist decision-makers with approvals and rejections, the Artificial intelligence method can also identify any inconsistencies or significant textual problems. The organizations have created a method to combine the power of connected devices with safe, accurate digital data archives in order to support businesses using blockchains (Javaid et al., 2021). With the approval of the current members or a central authority, additional verifiers may be added to permissioned blockchains' existing group of trusted parties to do verification. Such a setup is more comparable to a traditional banking environment, which employs a Know Your Business (KYB) or Know Your Client (KYC) method to whitelist users who are permitted to conduct operations in a specific space (Peters & Panayi, 2016).

2.2 Blockchain in Banking Industry

Banks have played a key role for cross-border fund transfers – a role the sector has played since the inception of monetary transactions. However, in recent times, the importance of banks in such cross-border transactions has diminished, with the spotlight now on businesses such as TransferWise and PayPal as these FinTech firms have proven to be superior to banks in terms of efficiency, cost, adaptability, and transparency. The primary tool utilized by banks for international fund transfers is the SWIFT network. Banks and other financial institutions can send and receive financial information using secured codes over the SWIFT messaging network. However, the process is time-consuming and expensive. When using Transfer Wise, SWIFT transactions take considerable time to close, with an estimated time ranging from 1 to 5 business days; SWIFT is also considerably expensive with a single transaction usually costing around $40-$50. To overcome these shortcomings, banks are increasingly looking into Blockchain as an alternative mechanism (Isaksen, 2018). Accordingly, the implementation of Blockchain can resolve the issue of cost and timeliness in cross-border transactions as these transactions will be carried out without a middleman. As such, self-initiated payment receipts and recordkeeping leads to low operational costs and customer enjoys a simple and transparent payment system (Petrov, 2019).

Trade finance becomes one of key operations in the banking system. Letters of Credit is one of the popular methods of trade financing and the procedure of creating a Letter of Credit is intricate and time-consuming (Gupta & Gupta, 2018). Smart contract is the recent advancements in blockchain technology (Cong & He, 2018). It is a digital contract that allow terms based on decentralized consensus, which are tamper-proof and often self-enforcing. With smart contracts, blockchain technology could help improve efficiency in the procedure of creating a Letter of Credit (Gupta & Gupta, 2018).

Know your Customer (KYC) is regarded as another crucial application of blockchain in banking industry. Before initiating any financial transactions, it is the bank's duty and requirement to record the customer's information and make sure that it is confirmed. The KYC procedure is typically completed by banks in roughly 26 days (Petrov, 2019). Customer data can be saved in a block using blockchain technology, and the block can be

shared between the banks. It improves operational effectiveness and eliminates repetitive tasks (Gupta & Gupta, 2018).

Capital markets have many intermediaries, including banks (primarily investment banks), brokers, investors, credit agencies, and other participants. Different clearing and settlement processes are utilized by the parties engaged in capital market and these processes are frequently cumbersome and ineffective (Petrov, 2019). The transaction of trade and custody securities services can be completed in real time with better efficiency and transparency if the collaborating companies share a blockchain platform. It can be utilized to keep the KYC process going and gets rid of the third party (Khadka, 2020). With the use of smart contracts, blockchain can alter the way transactions are issued, recorded, cleared, settled, and reported (Petrov, (2019).

Blockchain could change financial reporting and compliance as well. Banks and other financial institutions are required to perform reporting on a regular basis, including tax reports, audits, and other financial reports. Every bank is required to produce the reports on time, and it is particularly crucial to manage fraud and anti-money laundering actions. Blockchain technology may be useful in automating reporting; transactions are automatically updated and recorded.

2.3 Key challenges in Blockchain implementation

The capacity of a blockchain network to sustain both an increase in the number of network nodes and an increase in the volume of transactions is known as scalability. Due to the distributed ledger's permanent storage of information, scalability problems will arise as transactional data increases (Ali et al., 2020). To overcome the scalability, there is a method known as Simplified Payment Verification. It is a method that simply retains the block headers in a blockchain, significantly lowering the amount of data that must be stored by each node (Lin & Liao, 2017).

Blockchain transactions are carried out using a consensus technique that requires a lot of time and computer capacity to resolve the security issue, which calls for repeating the transaction across all platform nodes (Shorman et al., 2020). This is caused by the speed at which transactions occur, the complexity of blockchain systems, their distributed and encrypted nature, and the blocks' capacity restrictions (Chang et al., 2020). Blockchain is therefore viewed as being slow in comparison to other established payment processing networks like PayPal and Visa and MasterCard, which have transaction speeds of 450 and 50000 transactions per second.

Enacting laws and regulations pertaining to blockchain technology is still in its infancy, because the regulators involved have not yet acquired a comprehensive understanding (Zhang & Huang, 2022). As Ali et al. (2020) claimed, the regulators have not yet fully embraced the technology and there is a lack of regulation pertaining to blockchain transactions. This lack of supervision is causing businesses to be reluctant to employ the technology. However, many nations have started to focus on regulating the use of this technology to prevent illicit acts such as fraud, insolvency, and tax issues (Chang et al., 2020).

The difficulty of governance is another issue associated with blockchain (Shorman et al., 2020). The difficulty here is in getting everyone in the network to agree on the problems

that need to be resolved when integrating Blockchain into other banking services, which necessitates dealing with massive participant communities, which in turn makes decision-making difficult process. Additionally, the Blockchain system's distributed nature and immutability contribute to the governance's complexity. For examples: who, for instance, would announce faults, what appropriate techniques might be used to fix them, and how long it takes to fix them.

Interoperability is described as the capacity of various software applications and information technology-based systems to collaborate, share, and utilize the information/data (Dashkevich et al., 2020). There are difficulties with the compatibility of internal systems used by businesses today with blockchain technologies. When interacting with other systems that function in various contexts, development methodologies, and programming languages, these difficulties can present certain security concerns.

2.4 Block Chain Technology Adoption in Baking System

The banking sector urgently must modernize and is looking for new development opportunities. Blockchains could therefore upgrade and transform banks' credit information and payment clearing systems by revolutionizing the technology that underpins them. Applications for blockchain encourage the development of "multi-center, weakly intermediated" scenarios, which will improve the effectiveness of the financial sector (Petrov, 2019).

Guo & Liang (2016) identified that Blockchain could revolutionize payment clearing and credit information systems in banks by upgrading and transforming the underlying technologies. Furthermore, Blockchain could promote “multi-center, weakly intermediated” scenarios, causing banking efficiency to rise. Distributed ledger method was believed to be the key to success in the latest development in payment systems in the banking industry (IEEE Staff, 2018). Gupta & Gupta (2018) said that Blockchain is a disruptive technology and will cause the Indian Banking System to evolve into one with high speed, cost effective, and transparent transactions. The study highlighted the challenges of adoption of Blockchain like security, privacy, and scalability and emphasized the importance of handling them in order to make blockchain technology commercially viable.

Blockchain technology has unlimited prospects to change the whole financial industry via cross border payments, know your customer, trade finance, capital markets, as well as financial regulation and compliance (Khadka, 2020). Kaushik & Khatri (2021) discussed the different dimensions of blockchain technology in the Indian banking sector namely digital transformation and proposed a classification scheme for banking practitioners to evaluate their efforts on the interaction between banks and new technology and secured distributed database of client information. Nusrat (2021) opined how Blockchain technology can be applied in banks in a fast-growing economy like Bangladesh. The main challenges highlighted was interoperability between platforms. Finally, Singh et al. (2022) analyzed how the blockchain technology has the potential to revolutionize the banking industry in the area of industry 4.0. As the study highlighted, due to blockchain, distributed ledger technology; Peer to Peer lending and point to point transmission along with cryptographic encryption which ensures data integrity; operational reliance; speed and transparency and creating new business models, become financial advancements in the banking industry

To conclude, literature has provided variety of insights to the banking industry regarding the implementation of blockchain technology. Further, the prior studies have speculated about benefits that would be gained and challenges face when implementing blockchain technology. Eventhough discussions have commenced all around globe on this promising area, the literature on blockchain adoption within the Sri Lankan banking sector is limited. Hence, the present study intends to explore the feasibility of Implementing Blockchain Technology in the Sri Lanka Banking Sector.

3. Methodology

As per the research questions established, the study used phenomenological qualitative research approach, followed with inductive research approach (Saunders *et al.*, 2009). The qualitative approach was suitable since it allows describing experiences of the participants through formal or informal interviews (Creswell, 2013) and it facilitates the researchers to link to the phenomena under investigation. A purposive sample under non-probability sampling technique was employed to select desired sample of the study. The study was carried out with the banking professionals who are expertise in information technology. Authors believed that a banker who knows about the technology in banking sector would be able to answer the questions with regards to Block Chain Implementation in the banking sector.

The analysis was based on 6 scoping interviews conducted (5 male and 1 female), since information saturation was achieved at that level (Creswell & Clark, 2017). These participants had varying years of experience in bank's IT sector (3 participants with more than 20 years of experience, 3 participants with 10-15 years of experience) and education levels (4 participants completed professional qualification in bank and post graduate studies in IT, remains completed bachelor degrees in IT). Participation in this study was voluntary.

The process of data collection was performed through open-ended semi-structured interviews. Content analysis was used as the data analysis method. Content analysis is a systematic coding and categorizing approach used for exploring large amounts of textual information unobtrusively to determine trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication (Gbrich, 2007).

In the preparation state, the authors transcribed the interview and obtain the sense of the whole through reading the transcripts several times. In organizing phase in content analysis, two authors independently coded the interview data, and afterwards shared and agreed the coding which further improved the inter-reader agreement and reliability (LeVasseur, 2003). Next, the codes were collected under potential subcategories, comparing the emerged codes and clustered together (Clarke & Braun, 2017). The final stage of data analysis is related to reporting the result of the previous stages. In reporting, content analysis uses a descriptive approach in both coding of the data and its interpretation of quantitative counts of the codes. Thus, it is possible to analyse data qualitatively and at the same time quantify the data. In summary, we examined narrative materials from interviews by breaking the text into relatively small units of content and submitting them to descriptive treatment.

4. Findings and Discussions

First, the study examined the views on the supporting factors that will help the adoption of Blockchain technology in the Sri Lanka banking sector.

Fintech is one of the fastest-growing sectors for venture capitalists and it is believed as the modern union of financial services with information technology (Arner et al., 2015). As we see the Fin Tech boom has supported the adoption of new technology in the past, being consistent with those findings, 3 out of the 6 respondents commented on the impact of Fin Tech. They emphasized that Fin Tech as one of the justifications as why banks have adopted new technology.

"Fin Tech has revolutionized banking by disrupting it and challenging it to adapt new technologies and has changed the way we do banking." (R2)

As respondents specified, internet banking, mobile payments, crowdsourcing, peer-to-peer lending, Robo-Advisory, online identity, etc. are a few examples of the innumerable incremental and disruptive innovations that resulted from the continued development of Fintech.

The central bank is considered as the apex institution of the Banking system as well as the governing body for all banks, so when it comes to all things to do Banking it is very important to consider how the regulator will react. 4 out of 6 respondents believed that the central bank should have a positive view towards the adoption of Block Chain Technology and should facilitate to encourage blockchain technology usage. Meanwhile, central bank must establish a committee and that they are keen on observing the developments in the market. In order to implement Blockchain Technology, banks will need the regulators support and banks alone cannot successfully implement.

"CBSL is keen on the shared KYC (Know Your Customer), they have been focusing on shared KYC. The QR system is there currently for payments smart pay features etc., Block Chain Technology is not being focused as a payment system but rather as a point of information. The overall view CBSL has is quite positive." (R5)

Blockchain technology is a distributed ledger technology as the name indicates it is somewhat to do with a decentralized database, thus it is important to have a collaboration with multiple participants. Common forum will help to share the issues faced by the banks and work to solve them together. In here, respondents opined that the central bank has a key role to make the collaboration of all the banks.

"Back in the day when SWIFT was implemented Banks got together to have a common forum and all the issues were sorted so we need something like that for Block Chain Technology." (R3)

The cost of new technologies must be competitive with alternatives if customers are to adopt them. Otherwise, from the perspective of the consumer, the adoption of the new technology might not be viable (Suganthi & Suganthi, 2001). Consistency with that, 5 out 6 respondents highlighted the importance of customer perception on Block Chain Technology adoption, it was repeatedly said that customers will only adopt new technology if they see a real need to adapt to it or if they see a value in adapting to that new technology

Speaking on the capability of the Sri Lanka banking system, respondents believed that the Sri Lankan banks are more than equipped and could support the adoption of Blockchain

technology. Majority of the respondents compared the Sri Lanka Banking system to being on par with the Global Banking systems.

"Sri Lanka Banking system is equipped they are on par with the global banking sector, they will be able to handle it, most of the countries like USA it takes 3-4 days for CITS while in Sri Lanka it only takes around 2 days. In Sri Lanka Banks are tech savvy, our systems are capable of handling Block Chain Technology" (R6)

In sum, the respondents provide positive signals of adapting Blockchain technology in Sri Lankan banks especially the support from Fin Tech boom, stance of the regulator, initiating collaborative mechanism, creating a customer need and equipping with global banking technology.

Next, we discussed on the challenges for Blockchain implementation in the Sri Lanka banking sector.

People are resistant to change because they are typically out of fear of the unknown and its potential harmful impacts. 5 out of the 6 respondents agree on the fact of resistance, it could be resistance from the staff as they lack the knowledge and expertise and they have the fear of being replaced by new technology or it could be simply the customers are refusing to adopt and learn. *There is resistance to new technology as employees feel pressured and feared that they will be replaced by machines. Change management becomes very important in those instances.*

"You need to learn this from scratch, people will disagree on the new technology, you need to make them understand the merits of new technology. There definitely will be resistance, the fear of the unknown." (R2)

It is evident that resistance to change will have a negative effect on Blockchain adoption and it is vital that the banks should overcome this initial resistance in order to succeed in the implementation.

It is further noted that people do not know about Blockchain and its possible uses (Dile et al., 2021). This is posed as a barrier in adopting Blockchain technology in the Sri Lanka Banking sector. 5 out of 6 respondents agreed on this factor. Eventhough banks and other institutions have the technical expertise and know how on the Blockchain, lack of awareness of customer becomes the key bottleneck.

In globally, there is no proper regulatory framework supporting for the implementation of Blochchain into financial system, thus it becomes a massive barrier to adopt such technology. Guo and Liang (2016) and Gupta & Gupta (2018) mentioned that the regulatory restrictions pose a major challenge by highlighting the lack of regulation, the fact that banks even though interested in adopting in Blockchain are afraid to do so since there is no proper regulatory framework on the legitimacy of Blockchain.

", the interest of the regulator is not to adopt new tech and this is shown through the outdated regulatory framework." (R4)

"Existing laws must change in order to facilitate this adoption. There will be cross entities i.e., many parties verifying for others therefore laws and regulation should adapt accordingly." (R2)

Consistent with regulations, existing legacy systems of the banks also becomes a restriction to adopt Blockchain. The most of the banks run on old legacy systems so it is a challenging ask to build systems that run on Blockchain around them. Thus it poses interoperability or compatibility issue as it will be quite challenging to link these old systems to new systems. However, explanations given by the respondents indicated that some banks do run with new systems as well so in such cases those banks will be able to easily adapt to Blockchain.

"Some Banks have outdated systems, Commercial Bank, BOC run on a system called fiserr, they are very old legacy systems that they have built around them. Block Chain Technology is new technology so they cannot build on a core system. A system change is quite challenging, Bank to Bank it will be different. In DFCC they run 'themanos'." (R3)

Likewise, we scrutinized that customer and employee resistance due to lack of awareness, regulatory restrictions, and interoperability or compatibility in legacy systems are recorded as the main challenges when implementing Blockchain technology into banking system in Sri Lanka.

Finally, we explored the possible applications that the banks can utilize from Blockchain technology adoption.

No matter how many financial institutions a customer desires to work with, the KYC verification process is only carried out once for each of them. Customers can securely communicate the outcome of the primary KYC verification with any financial institutions they desire to do business with thanks to distributed ledger technology (DLT) (Parra Moyano & Ross, 2017).

Supporting the above finding all the respondents confirmed the concept of shared KYC, they mentioned that Sampath Bank PLC has been one of the pioneering Banks to implement this.

"According to the global market, especially in the area of CIF, the key parameters of a person, they have linked ID and information, you need not recreate the KYC, they have used the Blockchain very well." (R3)

The prior studies frequently highlighted that Blockchain technology can be used in trade finance specially for opening LCs; with the help of smart contracts and how data can be easily verified through Blockchain. 3 out of the 6 respondents acknowledged its possible use in Trade Finance, some even elaborated on 'Ethereum' based Blockchain technology known as the Trade Lens, a collaboration between Maersk in order to track shipments etc.

"Since Block chain helps to verify information, it can be applied when it comes to trade finance, generally shipping documents need to be seen and delivered place to place but with the help of a Block Chain the documents can easily verified and sent through and trade can take place much more effectively. Maersk and Customs have joined hands together for a Blockchain based solution called Trade lens." (R2)

International Monetary Fund identifies *Central Bank Digital Currency (*CBDC) as a new type of fiat money issued electronically by the central bank and used as legal tender (Adrian, 2019). In this regard, 3 out of the 6 respondents briefed on the use and concept of CBDC, they saw CBDC as very important application of Block Chain Technology and cryptocurrency.

"Things like CBDC will be a useful advantage of Block Chain Technology, CBDC or Central Bank Digital Currency is an end product, it is the responsibility of the Central Bank and it's a version of crypto where the Central Bank issues them." (R2)

The overall results of the study indicated the positive views on Blockchain technology implication, which would become simulations to introduce such technology into Sri Lankan banking system. Moreover, the catalysts will support identify the main obstacles and look at the strategies to overcome them. Finally, the possible applications of Blockchain technology are good indication of how this innovative technology can be used in the banking system in Sri Lanka.

5. Implications and concluding remarks

Based on Findings it was confirmed repeatedly that resistance to new technology, lack of awareness, regulatory restrictions as well as interoperability pose as major barriers for Blockchain technology implementation which also in turn act as hindrance for any such implementation. In order to get through the resistance to new technology it is important that the regulators and Banks follow the lessons learned from change management on how to deal with resistance. They need to make the employees or the internal staff realize that just because a Block Chain is implemented, they will not lose jobs; it will only make their workload less. For an example; when a shared KYC is implemented and verifications are done through a decentralized data base, then it will eliminate the need for tiresome manual processes.

Banks will have to get the support of their employees by providing them the necessary training and knowledge. The regulator will have a key role to play as they should also get the senior management to support this implementation, for any change to be implemented it is very important that there is top management support. So, Fin Tech companies, Block chain solution providers and Banks will have to lobby with the regulator in convincing the other banks as well as their own staff on the need for such an implementation.

In order to solve the lack of awareness, with the help of the regulator all Banks must carry out national campaigns and provide their customers with the necessary tools and expertise as well as elaborate on the benefits of Blockchain technology implementation. They should create the need for Blockchain in the minds of the consumers. It is true that Blockchain technology is just a back-end technology and the users will only see an interface but it is worth noting that there will be some changes when such technology is implemented, so it will be the duty of the Banks to teach their staff and customers on how to deal and adopt to change. On that note it will be important for banks to increase the financial literacy by creating awareness sessions at the corporate level. Also, they must make businesses aware on the possible uses of Blockchain technology. This will also motivate new entrepreneurs, startups and encourage new ideas which will help to create more and more Blockchain solutions.

It is very essential to have a common forum where Banks along with the regulator could openly debate and discuss their opinion with regards to Blockchain implementation and collectively work together in order to find solutions for problems that arise in terms of technical issues and other issues. This will help in accelerating the adoption process and this will be a good starting point for implementation.

Interoperability was another Bottleneck to the adoption of Blockchain technology. To overcome this, it is important that all existing systems that banks run are bought to par. Surely this will have a huge investment cost and presently with current economic crisis it may not be possible to do so, but is the strong belief that eventually the economy will revive. So, considering the future it would be wise for Banks to invest on this. Also, Banks with advance systems should help other Banks with outdated systems to adapt to the new systems. They may have a fear of losing out the competitive advantage that they have if they share such knowledge, but looking at the past it is evident that technology is evolving and it is important that Banks adapt to those new technology and think about the greater good.

Finally, the need for a proper regulatory framework should take precedence. This was not only in the Sri Lankan context but it was applicable in a global context as well. Globally countries like Cambodia, Singapore is looking at creating a proper regulation, thus following those foot-steps, Sri Lankan regulatory can follow the same. The Central Bank of Sri Lanka should look at other markets, look at the problems faced by those countries with regards to this and study and analyze this technology in order to design a set of protocols and standards so the use of Blockchain technology will be legitimized in the Sri Lanka Banking Sector. This will help in motivating the Banks and Institutions. It is true that Sri Lanka does not need to be the pioneer in anything at this instance, but if Sri Lanka has a plan to become a Global Financial Hub in South Asia. Using technology like Blockchain will help massively in bringing in the needed investments. It will further strengthen the Sri Lanka banking system as well as the overall financial system in Sri Lanka.

The study concludes with some limitations that may be worth exploring in future research. The study mainly focused on the interpretations of six main participants involved in the banking profession. A wider and more diverse group of participants from different authorities (Central Bank, Finance Ministry, Tech companies), would have made the study more representative. There may be unobservable characteristics such as risk taking ability, working culture, financial restrains that may also affect the adoption of Blockchain. These aspects could be explored in further research, and it is likely that these unobservable factors would reinforce the implementation of Blockchain. Despite the inherent limitations, the study will contribute to extend the existing literature on Blockchain adoption and that it will help to create the much-needed framework in order to successfully implement Blockchain technology in banking system while set precedence for future research on this area.

References

Ali, O., Ally, M., & Dwivedi, Y. (2020). The state of play of blockchain technology in the financial services sector: A systematic literature review. *International Journal of Information Management*, 54, 102199.

Arner, D. W., Barberis, J., & Buckley, R. P. (2015). The evolution of Fintech: A new post-crisis paradigm. *Geo. J. Int'l L.*, 47, 1271.

Central Bank of Sri Lanka (2021). Successfully Completes the Process of Developing and Testing a Blockchain Technology based Shared Know-Your-Customer (KYC) Proof-of-Concept (POC), Retrieved from https://www.cbsl.gov.lk/en/news/cbsl- successfully-completes-the-process-of-developing-and-testing-a-blockchain-technology- based-shared-kyc-poc (June 21, 2022)

Chang, V., Baudier, P., Zhang, H., Xu, Q., Zhang, J., & Arami, M. (2020). How Blockchain can impact financial services–The overview, challenges and recommendations from expert interviewees. *Technological forecasting and social change*, 158, 120166.

Chris, N. (2021). Trends In Blockchain: Why Big Banks Are Adopting This Technology. Forbes. (2021, June 23) https://www.forbes.com/sites/forbesbusinesscouncil/2021/06/23/trends-in-blockchain-why-big-banks-are-adopting-this-technology/?sh=2c11e3d351e2

Clarke, V., & Braun, V. (2017). Thematic analysis. *The Journal of Positive Psychology*, 12(3), 297–298.

Cong, L. W., & He, Z. (2019). Blockchain disruption and smart contracts. *The Review of Financial Studies*, 32(5), 1754-1797.

Creswell, J. W., & Clark, P. V. L. (2017). Designing and Conducting Mixed Methods Research, 3rd edn. Sage Thousand Oaks, CA, USA.

Dashkevich, N., Counsell, S., & Destefanis, G. (2020). Blockchain application for central banks: A systematic mapping study. *IEEE Access*, 8, 139918-139952.

Dilé, C., Toubal, M., & Bengtsson, F. (2021). Blockhain Technology in The Banking Sector: Applications and Challenges. Uppsala University Department of Informatics and Media Bachelor's Degree Project. https://www.diva-portal.org/smash/get/diva2:1568814/FULLTEXT01.pdf

Gbrich C. (2007). Qualitative Data Analysis: An Introduction (1st Ed.). London: Sage Publications.

Guo, Y., & Liang, C. (2016). Blockchain application and outlook in the banking industry. *Financial innovation*, 2, 1-12.

Gupta, A., & Gupta, S. (2018). blockchain technology application in Indian banking sector. *Delhi Business Review*, 19(2), 75-84.

Iyer, V., Mehmood, A., Babu, B., & Reddy, Y. B. (2022, October). Spatial Blockchain: Smart Contract Using Multiple Camera Censuses. In Proceedings of the Future Technologies Conference (FTC) 2022, Volume 2 (pp. 55-66). Cham: Springer International Publishing.

Jaoude, A. & Saade, G.R. (2019). Blockchain applications - Usage in different domains. *IEEE Access*, 7, 45360–45381

Javaid, M., Haleem, A., Pratap Singh, R., Khan, S., & Suman, R. (2021). Blockchain technology applications for Industry 4.0: A literature-based review. Blockchain: *Research and Applications*, 2(4), 100027. https://doi.org/10.1016/j.bcra.2021.100027

Kaushik, A., & Khatri, A. (2021). Systematic literature review on blockchain adoption in banking. *Pressacademia*, 8(3), 126–146.

Khadka, R. (2020). The impact of blockchain technology in banking: How can blockchain revolutionize the banking industry?. Thesis - Centria University of Applied Sciences Business Management. https://www.theseus.fi/bitstream/handle/10024/346030/Roshan_Khadka.pdf?sequen&fbclid=IwAR12lak_w32GbNIuk3n3fDDHYhQ43C6FIoWGexEDNVbZyqCMklEdB0DlmOk

LeVasseur, J., (2003). "The Problem of Bracketing in Phenomenology", *Qualitative Health Research*, 13(3), 408-420.

Lin, I. C., & Liao, T. C. (2017). A survey of blockchain security issues and challenges. *International Journal of Network Security*, 19(5), 653–659.

Nusrat, S. Use of Blockchain Technology in Banking in Bangladesh; Usefulness, Hurdles and Recommendations. *Electronic Research Journal of Social Sciences and Humanities*, 3(2), 8-15.

Parra Moyano, J., & Ross, O. (2017). KYC optimization using distributed ledger technology. *Business & Information Systems Engineering*, 59, 411-423.

Peters, G. W., & Panayi, E. (2016). Understanding modern banking ledgers through blockchain technologies: Future of transaction processing and smart contracts on the internet of money (pp. 239-278). Springer International Publishing.

Petrov, D. (2019). The impact of blockchain and distributed ledger technology on financial services. *Industry 4.0*, 4(2), 88-91.

Saunders, M., Lewis, P. & Thornhill, A. (2009). Research methods for business students, 5th Edition. Essex: Pearson Education Limited.

Shorman, A., Sabri, K. E., Abushariah, M., & Qaimari, M. (2020). Blockchain for banking systems: Opportunities and challenges. *Journal of Theoretical and Applied Information Technology*, 98(23), 3703-3717.

Singh, S., Choudhary, H., Kaur, S., & Mishra, A. K. (2022). Book review: P. Martino, Blockchain and Banking: How Technological Innovations are Shaping the Banking Industry. IIM Kozhikode Society & Management Review, 227797522210934. https://doi.org/10.1177/22779752221093421

Suganthi, B., & Suganthi, B. (2001). Internet banking patronage: an empirical investigation of Malaysia. *Journal of Internet Banking and commerce*, 6(1), 10-17.

Toufaily, E., Zalan, T., & Dhaou, S. ben. (2021). A framework of blockchain technology adoption: An investigation of challenges and expected value. *Information and Management*, 58(3). https://doi.org/10.1016/j.im.2021.103444

Viriyasitavat, W., & Hoonsopon, D. (2019). Blockchain characteristics and consensus in modern business processes. *Journal of Industrial Information Integration*, 13, 32–39.

Yaga, D., Mell, P., Roby, N., & Scarfone, K. (2019). Blockchain technology overview. arXiv preprint arXiv:1906.11078.

Zhang, T., & Huang, Z. (2022). Blockchain and central bank digital currency. *ICT Express*, 8(2), 264-270.