

**IMPACT OF BLOCKCHAIN TECHNOLOGY IN FINANCIAL SERVICES**

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**DECLARATION**

I declare that this or any other University has not previously submitted this work to award the course marks. This work contains no material previously published or written by another person except where due reference is made to the best of my knowledge and belief.

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**APPROVAL**

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## **DEDICATION**

This piece of work is dedicated to my beloved family members and friends who have supported me throughout my research work. I also dedicate this work to my dear colleagues at Riara University.

## **ACKNOWLEDGEMENT**

I would like to express my sincere appreciation to the almighty God for giving me life and good health and more an opportunity to pen this research paper.

## **ABBREVIATION**

DLT - Distributed Ledger Technology

ICT - Information Communication Technology

KYC - Know Your Customer

NASDAQ - National Association of Securities Dealers Automated Quotations

## **ABSTRACT**

Over the last few years, block chain technology has brought a dramatic change to the world, and it is considered a potential new revolution in the ICT area. Recently, some innovations are being introduced by using Blockchain technology to help ease the processes. Key industries have identified Blockchain technology as a disruptive opportunity to change the current paradigm. Blockchain Technology is highly likely to serve as the next generation of technology for all financial fields in the future. This technology has affected the financial services at an increasing rate. The financial firms are trying to cope with these changes by adopting new kinds of technology to deal with the high increase in financial services demand and the huge increase in the competition worldwide in the financial sector. Nowadays, customers are trying to use the financial services that offer ease of use, convenience, efficiency, and speed. Blockchain Technology is expected to be a disruptive innovation technology that will guide financial services over time. Therefore, the financial industry must assess the opportunities and challenges that Blockchain Technology will present. This study's main scope is to identify the impacts of Blockchain Technology on Financial Services.

**Keywords:** Blockchain Technology and Financial services

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## **CHAPTER 1: INTRODUCTION**

The basic component of business is exchanging, and exchanging exercises are subject to trust (**Tang, 2018**). Trust, through monetary instruments and systems, can motivate fruitful organizations. A trust-rating stage is an important part of the financial framework that is used to determine whether a client can be trusted. It rates a client based on their acquisition and reimbursement history, credit status, and other information to determine whether to support the advance, credit breaking point, or rebate, and so on. Amazon, for example, suggests online business stages, an Amazon commercial center, and a trust-rating stage. Clients can get limits, request merchandise/administrations, and so on based on their trustworthiness scores. (**Dong et al., 2015**).

Monetary innovation, also known as FinTech, is the "marriage" of money and innovation. When you combine innovation and accountability, you get a multiplier effect that is more generous than the sum of the two. According to Zetzsche et al. (2017), current FinTech deviates from two critical patterns. The main pattern is the acceleration of progress brought about by Big Data, AI, and commoditization. The following pattern is the increased number of new non-monetary firms that have entered and invested in monetary administrations organizations. Fintech is an important area in the advancement of Industry 4.0 because it necessitates the use and incorporation of various innovations, such as AI and Data Science, and it also provides a platform and programming as a service for assistance for Industry 4.0 (**Dhanabalan, and Sathish, 2018; Mashelkar, 2018**).

FinTech can also be viewed in two ways, as shown below (Tang, 2018). The primary metric focuses on traditional monetary endeavors that drive change through the use of innovation. Traditional financial undertakings, for example, Pingan Group, Industrial and Commercial Bank of China, Morgan Stanley, and Goldman Sachs, use massive data and other new advances to overhaul and change their administration. The following metric is that some innovation endeavors attempt to exploit their advancements to advance monetary administrations. For example, the underlying goal of Facebook, Apple, and Google, among others, was to avoid engaging in monetary exchange. However, in the end, they chose to create their own versions of

financial administrations to meet the needs of their clients and make new types of enterprising money scene.

The traditional financial industry has been impacted by FinTech. Following the 2008 Credit Crisis, the financial sector landscape has changed as a result of overall financial regulation and financial technology innovation (Anagnostopoulos, 2018; Brem et al., 2017). FinTech's primary breakthrough directions are as follows. The first is mobile payment, which includes services such as WeChat payment, Alipay, and Apple Pay. The second is based on "smart contracts," and includes Chinese brands like "Ant Xiaodai," "Jingdong Baitiao," and "Huabai." P2P lending is also included in the smart contact category. The third, and most well-known, is known as the Blockchain. The primary characteristics of these three major FinTech topics are instant contact, live data, credit ratings, and updates.

The financial industry is fascinated by Blockchain technology because its characteristics allow people to build trust faster and have the potential to change the financial infrastructure **(Pilkington, 2016)**.

## **1.1 Background**

Because of the rise of bitcoin, blockchain technology has gained traction. Nonetheless, this innovation isn't limited to the financial sector. A blockchain, at first glance, implies squares of cryptographic forms of money linked by chains. This novel concept has received careful consideration in the FinTech industry (Mu, 2016). Each square contains a cryptographic hash of the previous block, a timestamp, and exchange information. Satoshi Nakamoto created the first Blockchain in 2008, using a Hash cash-like technique to add squares to the chain without the involvement of a trusted outsider (Narayanan et al., 2016). Blockchain, a rapidly evolving financial innovation, is changing the way people manage organizations (Antonio and DiNizo, 2018).

Blockchain is regarded as a fundamental innovation for bitcoin and other digital forms of money (Nguyen, 2016) because it is regarded as another global exchange establishment (Staples et al., 2017). A Blockchain is a never-ending record information base that is completed, conveyed, and

unchangeable (Yoo, 2017). The most magnificent value of Blockchain is a decentralized framework with an extremely long security chain. The distributed trust provided by Blockchain technology is the critical advancement:

- Removing the trusted third party to facilitate transactions
- Decreasing the cost of trading
- Reducing the time (Staples et al., 2017).

Thus, Blockchain is expected to set off the industrial and commercial revolution and promote economic reform worldwide (Underwood, 2016).

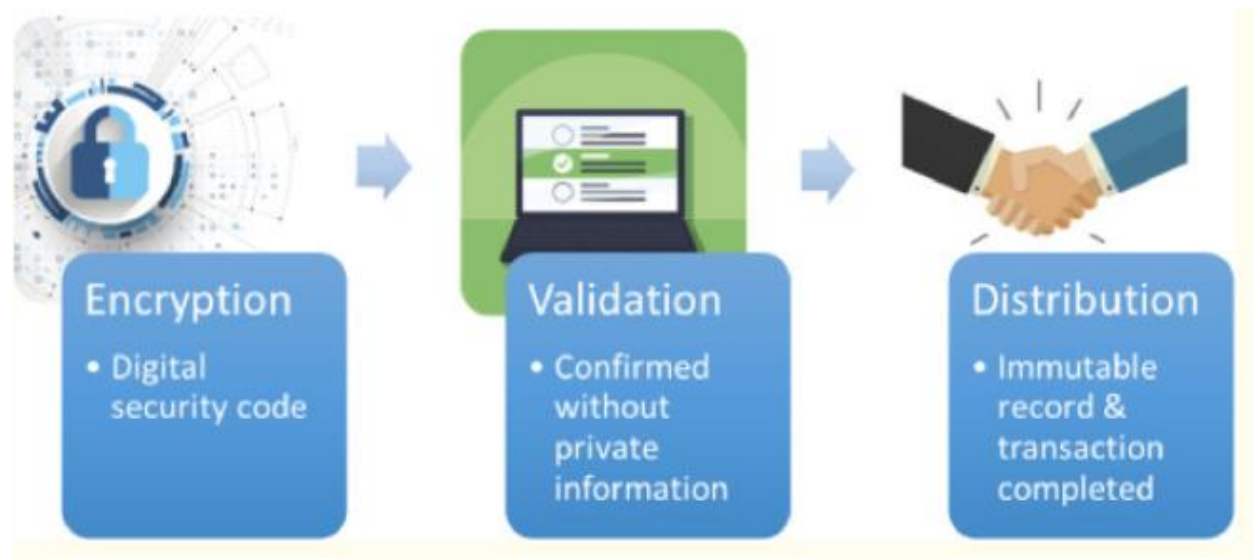


Figure 1: How Blockchain Works

The figure above shows a view of how Blockchain supports the transaction between the two parties. Firstly, Blockchain uses encryption to produce a digital security code. Then the users can validate the transaction without private information. Because the record in the Blockchain is immutable, the transaction will be completely automated and distributed.

**Tapscott and Tap Scott (2017)** point out the five main principles of the Blockchain:

Computational Logic, Peer-to-Peer Transmission, Irreversibility of Records, Distributed Database and Transparency with Pseudonym.

## **1.2 Problem Statement**

Currently, the financial service market is proliferating. Clients and customers have to trust their money through the use of financial services by depositing, buying insurance, through secondary trading, among others. Trust must also exist in the financial marketplace as traders hope that trades are carried out fairly and transparently. Banks and other financial institutions lay their trust in the back-office procedures of reconciliation of the centralized ledgers and accounting systems.

However, this is very costly, and this calls for a faster, efficient, and risk-free means of transacting and making payments within the country as well as making cross-border payments. Blockchain technology is proving to be the best solution for these requirements despite its tender age in the financial service sector.

## **1.3 Research Objectives**

1. To explore the key advantages blockchain technology offers
2. To assess the impact of the use of blockchain technology in the financial sector
3. To identify how Blockchain is adopted in financial sector
4. To assess the challenges that blockchain technology adopters are facing in the financial sector

## **1.4 Research Questions**

1. What are the advantages of the use of blockchain technology in finance?
2. How does the use of blockchain technology affect the financial sector?
3. How is Blockchain technology adopted in the financial sector?
4. What are the challenges that blockchain technology adopters are still facing?

## **1.5 Justification**

It's important to consider how Blockchain technology in financial services impacts business performance as companies continue to invest heavily in the technology. Researchers will be able to better understand how Blockchain technology has revolutionized the global financial system, making it more safe and effective, thanks to the findings of this report.

## **1.6 Scope of the study**

This study, titled "The Impacts of Blockchain Technology in Financial Services," aims to evaluate the degree of confidence and protection that clients can expect while using financial services on the Blockchain, such as depositing money, purchasing insurance, and secondary trading. The aim of this research is to find out how Blockchain technology impacts in the financial sector. The research will therefore be limited to a few organizations within the Nairobi central business district (CBD).

## **1.6 Limitations of the study**

The development of Blockchain is not mature yet. Some challenges have arisen, such as scalability, security, privacy, latency, etc. It is important for financial markets to have a better understanding of the Blockchain industry and find robust solutions.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

In recent decades, due to the dramatic and exponential growth of block chain technology, significant progress has been made in different fields. A variety of block chain technology applications exists. In this section, we review block chain applications in the area of finance and other fields as well

### **2.2 Theoretical review**

#### **2.2.1 Effects of Block chain in Finance**

Banking on Blockchain argues various financial benefits of block chain technology. The authors start by using a bank as an example and all the resources that are essentially wasted due to having to store and account for all transactions themselves. (Coco, Pinna, & Marchesi, 2017) argue that less resources used, be it hard drives to store their information to the added electricity needed to run in, not only cost banks more money than a ledger built from a block chain, but result in fewer resources being used. As a result, this would be helping the environment as it would mean less electronic waste and energy consumption. Furthermore, the cost of a block chain transaction has become less expensive as the average of power consumption per transaction (measured as Wattage over Gig hash per second, or the amount of electricity that one billion small tasks consumes). As the technology becomes more widespread, the technology becomes more efficient. In October 2014, this power consumption was rated at 0.69 W/GHps and nearly two years later in September 2016 it was down to 0.099 W/GHps a scant 14 percent of the energy cost. Thanks to the rising cost of Bitcoin, interest has also risen, resulting in more miners, which is the cause of the more efficient transactions, which the paper argues offsets the additional costs of increased electricity use and mining hardware costs. After the resource argument, the article pivots to address the inherent security within the ledger thanks to its ability to keep a record of previous transactions in the earlier one. This new ledger would allow the bank to keep safer records that are less likely to be tampered with while also allowing them to have a more honest view into potential investment opportunities, it would be more apparent if someone tried to quickly cook the books (Cocco et al., 2017).

### **2.2.2 Effects of Block chain in Product Traceability**

Lu and Xu provide an example of how they deployed block chain technology in a system of product traceability in China (Lu & Xu, 2017), it also has some inherent challenges and limitations. To reaffirm the positive effects, it can help ensure the security of traceability data that is both transparent and tamper-proof. On the other hand, because the data on block chains continually grows, it is essential to consider what data is stored "on-chain" and "off-chain." While traceability data and smart contracts are ideal to store on the block chain, a lot of information is simply too large to be stored in the block chain or needs to be kept private. This means that even when block chain technology is used, it has to be done in conjunction with other data storage methods. This can be very tricky and complicated, not to mention the challenges of adoption of the technology in general. Blockchain is new and dynamic, and this makes it a tough sell for parties who are resistant to change.

### **2.2.3 Effects of Blockchain technology on City Planning**

"Smart cities" refers to city planning involving three primary factors that would allow a city to thrive through social sharing of goods and services. Those three primary factors being the human element, improvements and implementations of technology, and citywide organization to bring them all together (Sun, Yan, & Zhang, 2016). As human populations worldwide continue to expand, "more than half of the global population now lives in urban areas, and an additional 2.5 billion people are predicted to move to cities by 2050" [Sun et al. citation here]. Due to the problems that come from these surging urban populations, residents find themselves with various problems such as traffic, pollution, and waste that are only getting worse (Sun et al., 2016). Fortunately, there seem to be a number of technological innovations that look to alleviate some of these problems. For the sake of simplicity, we will primarily focus on the platform of vehicle sharing, which addresses the three big concerns mentioned previously. Through vehicle sharing, fewer cars need to be on the road, resulting in less pollution through exhaust, and less waste as fewer cars would need repairs. So while the human and technological aspects of a smart city have not been addressed, a perceived concern for this social model is a lack of public trust, and this is where block chain technology comes in. Through increased and decentralized record-keeping that the block chain affords, previous issues such as "fraud, liability, and unskilled service providers" (Sun et al., 2016) would no longer become a concern. With less risk and



increasing reward, the third primary factor, a city-backed block chain platform based at organizing and tracking all of these interactions could be the guarantee that would allow such a smart city to develop

#### **2.2.4 Effect of Blockchain on Higher Education**

Tapscott and Tap Scott (2017) assert that block chain is the most important technology for higher education as we move into the future. They offer warnings of what will likely happen if such technology is not adopted, but also encourage us to explore the vast possibilities of how the state of higher education might be improved through block chain technology. They identify four areas for innovators to focus on in higher education: student records, pedagogy, costs, and educational models (or the meta-university). Key to their argument is the concept of value and how the internet is very limited in this sense. The internet allows us to share information, but when we share documents and files, we're sharing copies, not the original. They point out that the block chain can be used to store just about any type of information or data that is important to humankind. It can be used to store every single piece of data about people throughout their entire lives. This technology can, and in their view will be, used to record educational achievements throughout the course of How as well. As technologies like block chain become more and more intertwined with jobs and employment in the 21st century, they also explain how higher education will be pushed to assimilate or lose its relevance. While it is not easy for institutions of higher education to change, they argue that the move to the block chain will likely force them to find ways to stay relevant.

### **2.3 Implications**

As discussed in the thematic analysis above, block chain has implications for a wide variety of fields. Some are more hopeful, or seem more useful than others. While it might be too difficult to see applying block chain to really intricate and highly regulated industries like securities at the moment (Tranquillini, 2016), we can see that it has already had some degree of success with things like product traceability (Lu & Xu, 2017). We have also seen that many researchers are confident it can be applied to things like food security (Ahmed & Broek, 2017), city planning (Sun et al., 2016), property ownership (Ishmaev, 2017), and financial transactions (Cocco et al.,

2017). The implications and challenges vary greatly between each industry. For food security, the benefits are largely tied to product traceability and preventing such issues as fraud and transmission of foodborne contagions. The benefits for city planning are largely social and focus on helping people to navigate both the infrastructure and social parameters of a city – such as trust and transparency in managing decentralized work-forces. Finances are the most obvious application of block chain. This technology has risen to stardom primarily through block chain and other crypto-currencies. Currencies like bitcoin and ethereum were created for the block chain, and have witnessed explosive growth. There is a greater potential for block chain technology beyond cryptocurrency itself, and it has huge implications – from increased transparency, to minimizing transaction fees by bypassing third-parties like banks. Figure below illustrates why this technology should be used in near future.

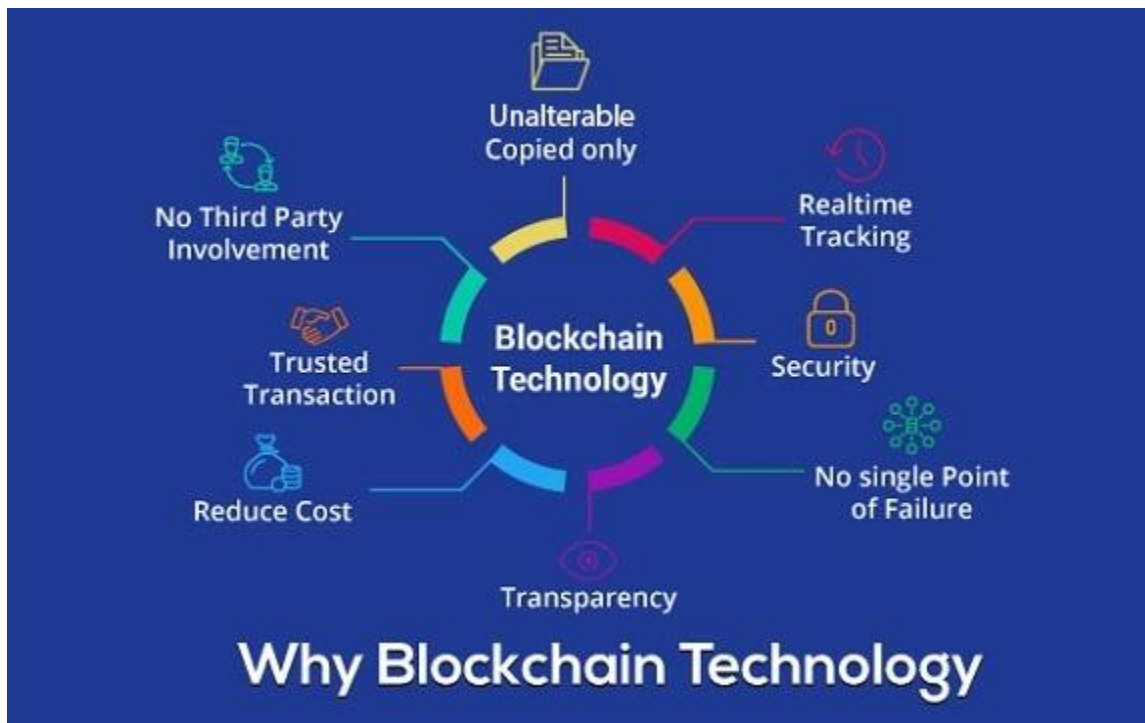


Fig 2.: Why use Blockchain technology?

#### 2.4 The block chain security model

The block chain security model block chain creates a proper secure, democratized platform independent of all the parties involved in it. The risk is totally eliminated by distributing the transactions across multiple sources, thereby it limits the possibility of hacker attack damage. In the block chain system, there is no single person who will hold the records, and no one can delete from it. Each identity is registered and secured with the device public key and private key.

The public key in the block chain uses computers connected to the public internet to validate the transactions and bundle them into the blocks. The private block chains are commonly designed around the principle of inconspicuousness. It is used to identify members to confirm membership. So the members in the network know exactly who are all dealing with them. Smart contracts will come to generate true business representations. Humans, machines, and the internet will communicate by respecting contractual obligations and deliverables. Smart contracts eliminate violations, confusion, and fraud amongst devices. Even more crucially, the human job of the contractual conditions audit will be replaced by these digital contracts. Blockchain presents sufficient opportunities in Iota. It will change the current state of things by giving it more transparency and making it fully secure.

## **2.5 Effects of block chain on finance.**

### **2.5.1. Immediate Payments**

Transactions can be completed in minutes or seconds, while settlements can take up to a week at the moment. Settlements become user-optimized with Blockchain, which saves all parties a great amount of time and money. Because transactions settle immediately, block chain will eliminate the need for a large number of middle and back-office staff at banks. There's a big push to look into Blockchain for bettering settlements, and some banks are looking into internal options first, while others are looking into options between banks.

### **2.5.2. Increase capital efficiency**

One of the most important characteristics of Blockchain is that it eliminates the need for a trusted intermediary and allows for peer-to-peer transactions. When Blockchain is used in the financial services industry, it has the potential to revolutionize the industry. Fee-charging intermediaries such as custodian banks (those that transfer money between different banks) and clearers may become obsolete as a result (those vouching for counterparties credit positions). As a result of the dramatic reduction in operational costs for banks, Blockchain allows for better capital optimization. Furthermore, when banks share a Blockchain, the total cost of the Blockchain and its ecosystem may be greater than the cost of managing transactions at a bank individually. The

costs, on the other hand, are shared among all participating banks, resulting in a substantial cost reduction.

### **2.5.3. Reduced counterparty Risks**

When transactions are settled almost immediately, it eliminates a large portion of the risk that the counterparty will be unable to meet its obligations, which could be a huge cost for banks.

### **2.5.4 Smart Contracts Improve Contractual Performance**

Smart contracts, when used by banks and financial institutions, increase contractual term performance because they execute automatically once certain pre-set conditions are met. It's critical that those smart contracts are firmly rooted in law and adhere to any regulatory requirements, including cross-jurisdictional compliance if necessary.

### **2.5.5. Increased Transparency**

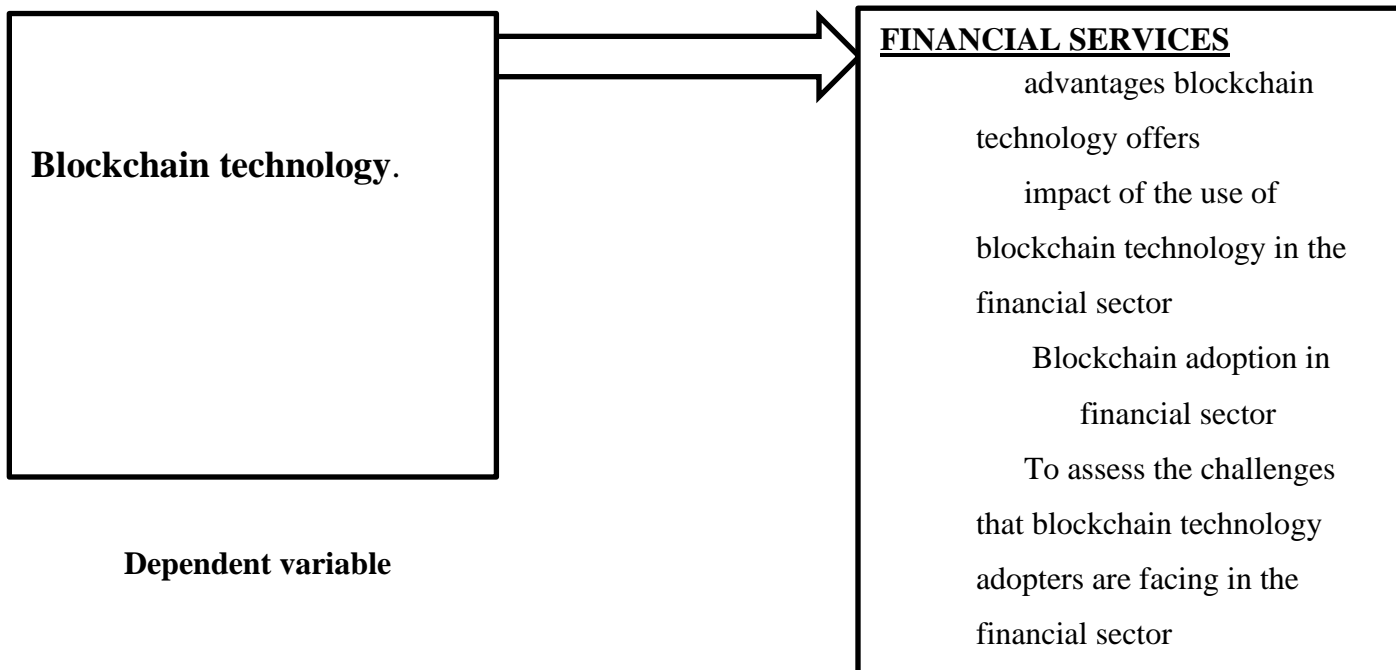
If regulators have access to the block chain, there will be more transparency among financial institutions, which will result in better regulatory reporting and monitoring by central banks.

### **2.5.6. Increased Error Handling and Reconciliation Reduced**

The immutability of any data recorded is a key feature of Blockchain. Any data stored on a block chain can be tracked in real-time, providing a comprehensive audit trail. As a result, it removes the need for error correction and reconciliation.

## **2.6 Conceptual framework.**

Conceptual framework can be described as the reasoning or tentative conclusion of a researcher is put in a logical sense. The conclusions are based on a study of the literature in which the evidence is either lacking or the assumptions reached are inadequate. It's a set of interconnected ideas that paint a complete picture of a phenomenon. A conceptual structure, according to Miles and Huberman (1994), "lays out the main causes, structures, or variables, and presumes relationships among them" (p. 440). Moderating, independent, and dependent variables are all part of the study's conceptual structure as shown in the figure below;



**Figure 3: Conceptual Framework**

A dependent variable is a response variable that is observed and calculated in order to ascertain the effect of the independent variable. The efficacy of capital utilization to increased immutability and transparency all are part of benefits of use of block chain technology which influences the block chain security model

## 2.7 Case Study

### 2.7.1 BitPesa

BitPesa is an organization based in Nairobi, Kenya, which operates in the money transfer market and it uses block chain technology, bitcoin in order to reduce the cost of international money transfer. In this regard, Bitpesa’s primary focus is on the Kenyan remittances from overseas with a view to grow across East Africa next and the African continent at large. According to Bitpesa, its emphasis on the use of Bitcoin service is to reduce the cost of money transfers to Kenya, increase the speed of money transfers and make it as convenient as possible for users to transfer money to Kenya. Bitpesa targets to reach the Kenyan community within the UK to understand their unique needs and tailor their products to meet those needs.

Their choice of Kenya as their sub-Saharan headquarters was guided by her central location and her innovation culture as seen in the mobile money front (Smart Kenya, 2014). The company has five employees, most of which are in senior management. Bitpesa was used to collect quantitative data as regards to the cost of money transfers which would show the impact of the use of Bitcoin on the cost of international money transfers. Secondly, the challenges that are faced by Bitpesa customers provided data to study the factors that influence the adoption of Bitcoin currency in Kenya.

### **2.7.2 BitSoko**

It is an Android mobile wallet that implements Blockchain technology in a bid to both remove the cost of transferring money between two individuals and to increase access to payment services. Their innovative solution doesn't just allow bitcoins to be instantly sent around the world at minimal cost; they integrate Blockchain technology into the current mobile money platform in Africa and service providers, allowing access of funds to be sent from the developed world through Bitcoin to be received as mobile money. By integrating specific services such as energy providers, paying bills, payroll solutions for merchants in Kenya, they hypothesize that the easy-to-use services will create a system that can support small scale payments in all aspects of financial lives. They provide solutions to lower the costs of sending and spending funds can provide the stability and empowerment for further solutions and innovations to be created on our open development platform

## **2.8 Conclusion**

With block chain technology possessing such a large appeal, we are already seeing widespread adoption. As nearly every industry utilizes some sort of agile, record-keeping practices, it is not unreasonable to expect to see this technology applied to a wide range of applications some of which are hinted at in our previous sections such as the potential for a smart city, while others are either still in development or have yet to be discovered. Furthermore, due to the peer-to-peer nature of this technology and every stakeholder having access to their block of the ledger, cooking the books or falsifying data has never been harder. This alone has the potential to increase consumer confidence in these new technological disruptions. As with any new

technology, the underpinnings are not well understood, and for that reason, it is difficult to say how widely adopted the technology will be.

## **CHAPTER 3: SYSTEM ANALYSIS**

### **3.1 Introduction**

This study is aimed at evaluating the impact of block chain technology on financial service in Kenya with a particular interest in the study of use of Bitpesa as an international financial service provider, hence considering the impact on the cost of international funds transfer and performing a comparison to assess the impact of block chain. This chapter therefore describes the research methodology, company study case, and the data collection and analysis methods used.

### **3.2 Research Design**

Descriptive analysis is a form of research that concentrates on defining the characteristics of the population or phenomenon being studied. This method focuses on the "what" of the research question rather than the "why" of the study. Descriptive research is employed in this study to describe and understand the impact of block chain technology on financial service in Kenya. The study used a case study of Bitpesa and BitSoko, digital money service providers in Kenya which enables users in Kenya to receive money sent. They operate just like M-pesa, just that it incorporates aspects of block chain technology. It is a source of quantitative data as regards the transaction charges, payment efficiency, transfers which was used to show the impact of the use of digital currencies on the cost of international money transfers. Secondly, qualitative data about the challenges that they have encountered as financial service providers in the adoption of the Blockchain technology into their system was collected using an interview process.

### **3.3 Research site**

The test site is the venue where the analysis will take place. Contributes what the research site adds to the study's importance, weaknesses, scope, and assumptions. This research site is based on the case study of Bitsoko, a startup organization dealing with Blockchain technology to reduce transaction charges fee to zero and provide a secure platform for their clients despite high technology maintenance.



### **3.4 Target population**

The term "target population" refers to the entire community of people or things to whom researchers want to generalize their findings. The focus of the study included the Bitsoko community; C.E.O of Bitsoko and assistant C.E.O of Bitsoko in Nairobi.

### **3.5 Determination of study sample.**

#### **3.5.1 Sampling procedure**

Sampling is a statistical analysis technique that involves selecting a predetermined number of observations from a larger population. Depending on the type of analysis being performed, the methodology used to sample from a larger population may include simple random sampling or systematic sampling. This research study used a random sampling procedure. It is the least prone to bias because there is no human judgment involved in selecting the sample. A census is an attempt to gather information about every individual in a population. In a survey, data are only collected for a sub-part of the population; this part is called a sample. The data is then used to estimate the characteristics of the whole population. In this study

#### **3.5.2 Sample size**

The number of patients or other experimental units used in a study is referred to as the sample size, and determining the sample size necessary to answer the research question is one of the first practical steps in trial design. In this research, the sample size was determined by 20% of the total number of members in the organization. organization In this study purposive sampling was used such that there was a criteria for selecting individuals .2 people were therefore interviewed through telephone interview surveys.

### **3.6 Data Collection**

The information about the cost of international funds transfer services in Kenya was collected using secondary methods of data collection as this information was publicly available on company publications, press releases and company websites.

Primary data was collected through in-depth phone interviews which were organized with the

employees of BitSoko. The company had five employees at the time of conducting the research. The response rate was positive though BitSoko being an international company, a senior manager targeted as responder helped in gathering data on the research. She gave more insights that might not have been captured using a structured questionnaire since this more about the experience and effect so far on financial services.

### **3.6.1 Data collection tools or instruments**

These are the methods for collecting knowledge. They are the instruments used to collect data. Some of them include questionnaires, interviews, observations, and reading. Essentially, the researcher must ensure that the instrument he or she selects is accurate and trustworthy. The appropriateness of the instruments has a significant influence on the research project's validity and reliability.

The method of collecting data used in this research is interviews. It is a conversation in which the interviewer asks the interviewee oral questions in order to evoke an oral response from the interviewee. In research interviews, the interviewer must identify a potential source of information and set up the conversation such that the respondent offers pertinent information. As a result, the effectiveness of such an interaction hinges on the development of a friendly atmosphere. Video conferencing technology allows for interviews to be conducted over the internet or at a computer terminal in addition to face-to-face interviews.

Interviews have their own advantages and disadvantages, which include; Improved Communication: Facial expressions and gestures aid communication by allowing tone, pitch, and intensity of speech to reinforce the speaker's message. Motivate yourself: Interviews can encourage initiative in interviewees and empower them to work honestly. While interviews in modern large organizations, interviews are extremely difficult to execute, particularly if multiple divisions or departments are located in different locations. It won't work if the listener isn't paying attention: The listener's attentiveness is vital to the interview's performance.

### **3.6.2 Validation of the instrument**

The accuracy with which an instrument measures and performs the tasks for which it was designed is referred to as validity. Since it is uncommon, if not impossible, for an instrument to be completely valid, validity is normally calculated in degrees. Validation is the method of obtaining and testing data in order to evaluate an instrument's accuracy. A phone interview was conducted by the researcher through the guide of interview questions based on the research questions and objectives. Dry runs were used to identify any ambiguous instructions and mistakes within the interview. At the point where all the validation documentation has been verified, all documents will be versioned, approved and signed by the supervisor. Discussed the interview questions and thoroughly scrutinized them and found them to be appropriate and correct.

### **3.7 Data Analysis**

Data analysis is the process of cleaning, transforming, and modeling data in order to uncover useful information for business decision-making. Data analysis is the process of extracting useful information from data and making decisions based on it. The data analysis used in this research is qualitative data due to the use of interviews. The practice of continuously looking at and composing the interview reports, observation notes, or entirely different non-textual materials that the investigator accumulates to enhance the understanding of an occurrence is known as qualitative data analysis. The majority of the time, the method of analyzing qualitative data entails writing or categorizing the data

## **CHAPTER 4: RESULT FINDINGS**

### **4.1 Introduction**

Each and every day, many financial transactions are witnessed that are worth Trillions of dollars. Blockchain technology that began with bitcoin and other cryptocurrencies and has since spread to nearly every sector. It's a protocol or a way of recording transactions that uses complex algorithms and encryptions to ensure that they're trusted, irreversible, and easily accessible to everyone in the system. Blockchain technology has been the most significant catalyst for the transformation of financial services. Stock market, banking, asset management, and insurance are only a few examples.

Blockchain is a technology that creates a secure, tamper-proof, and easily accessible ledger of internet transactions. Blockchain, like the internet, has no central authority; instead, it is a distributed ledger of transactions that is shared among a large number of users. It's made up of a series of data blocks, each of which records information. The blocks are said to be linked and secured using advanced cryptography.

### **4.2. Presentation of findings**

#### **4.2.1 What are the advantages realised by BitSoko through the use of blockchain technology in finance?**

##### **1. Instant transactions**

Settlements can currently take up to a week, while transactions can be done in minutes or seconds. With Blockchain, settlements become more user-friendly, saving all parties a considerable amount of time and resources. Blockchain would remove the need for a large number of middle and back office workers at banks because transactions settle instantly. As a result, banks have a strong desire to investigate Blockchain as a means of improving settlements; some banks look into internal options first, while others look into options between banks.

Blockchain technology has revolutionized the industry and has the potential to greatly simplify foreign money transfers.

Businesses and customers face delays, extra costs, and paperwork when sending money the conventional way. Blockchain, on the other hand, provides an easier, quicker, and less expensive way to execute cross-border transactions, which is why more banks are working with cryptocurrency.

## **2. Secure payment solution**

As transactions happen quicker, hackers have less time to access transaction data or redirect payments. Any process in the blockchain security model has two keys: one is open to all users, and the other is shared only by transaction participants. The public one can be used to view a user's balance and financial history, but not to learn their name. The private key can only be used for one transaction at a time. As a result, even if a hacker obtains the private key, they will be unable to make a money transfer, greatly improving the security of funds and identity.

## **3. Improve Capital Optimisation**

One of the most important characteristics of blockchain is that it eliminates the need for a trusted intermediary and allows for peer-to-peer transactions. As Blockchain is used in the financial services industry, fee-charging intermediaries such as custodian banks (those that move money between banks) and clearers can become obsolete (those vouching for counterparties credit positions).

Due to a major reduction in operating costs for banks, blockchain allows for better resource optimization. Furthermore, as banks share a blockchain, the overall cost of the blockchain and its ecosystem can be higher than the cost of handling transactions at a bank individually. However, since the costs are shared by all participating banks, there is a major cost savings.

### **4.2.2 How does the use of blockchain technology affect the financial sector?**

Blockchains have the potential to replace any business activity that relies on traditional corporate databases, which are at the heart of virtually every financial service function. Any financial

operation with low transparency and traceability has the potential to be disrupted by blockchain technology. As a consequence, DLT is both a fantastic opportunity and a potentially dangerous threat. According to Weber and Novocin, next-generation start-ups will build new blockchain-based services and businesses in the same way that disruptors like Amazon, Google, Facebook, and Uber built software systems and thriving businesses thanks to Internet standards' connectivity. Blockchain, as a distributed technology, is expected to become the foundation for new services and applications, according to many experts.

#### **4.2.3 How has BitSoko adopted Blockchain technology in the financial sector?**

This being is a mobile payment platform that uses blockchain technology to bring free merchant and payment services currently in Kenya and the greater sub Saharan africa. Bitsoko is designed around a money transfer wallet and a POS service, bringing together the versatility of blockchain based technology and the good attributes of mobile money.

By integrating specific services such as energy providers, paying bills, payroll solutions for merchants in Kenya, they have hypothesized that these easy-to-use services will create a system that can support small scale payments in all aspects of financial lives. These solutions to lower the costs of sending and spending funds can provide the stability and empowerment for further solutions and innovations to be created on our open development platform. We can replicate our services to integrate Blockchain with mobile money in East Africa throughout the continent and the rest of the world. Having employed the use of inter-currency operability, this helps manage digital money.

#### **4.2.4 Challenges that BitSoko face in the adoption of blockchain technology in the financial sector.**

##### **1. Initial, Implementation, and Maintenance Costs**

The initial cost of putting a block chain system in place is extremely high. It necessitates a significant amount of feedback in terms of the software and hardware required for its initial launch. Due to their financial situation, small investment and banking firms may be unable to

cover such expenses. Making and recording transactions using this system, as a result, becomes a burden for such businesses from the start. The cost of maintenance is still high. Finance companies that view such a system as a liability may overlook its high maintenance costs, which reduces the overall profits of the company.

## **2. Data Modifications**

It also creates a problem with data alteration. The banking and finance industries make frequent changes to the data they store, particularly data that involves a transaction. Because of the challenges in making such changes, the Blockchain system becomes more of a liability for the company than an asset. As a result, the majority of these financial institutions have stopped using it for transaction recording. The data entry process is also lengthy. Given the volume of transactions in the financial sector on a daily basis, such a lengthy process could cause a delay in the recording of any such transaction, making the system inefficient.

## **3. Requirements for Literacy**

The Blockchain system necessitates advanced literacy, particularly computer literacy. As a result, illiterate workers are unable to properly record information in the system. As a result, the corporation that employs it is forced to recruit literate workers. The cost of hiring such workers is high for the company. As a result, many businesses prefer to offer top retail to their existing workforce rather than adopting the system and then having to retrain large segments of their workforce. The other option is to retrain existing employees. Because this is a costly undertaking, some businesses may opt not to participate.

## **4. Blockchain Timeframe**

There is no guarantee that the transactions recorded in the system will last for an extended period of time. Because the system's operations are cryptic, it's impossible to say how long transactions will last in the system. Most financial transactions necessitate knowledge of previous transactions and their implications for the future. In the financial industry, the system becomes ineffective if the duration of such records is unknown. This system's computer language is complex and difficult for ordinary people to understand. Today, the computing language is also a major block chain issue.

## **5. Blockchain Rules and Regulations**

There are a slew of block chain rules. Any company faces difficulties as a result of such rules. To save time during the setup period, most companies tend to run and use systems with few rules. As a result, the lengthy procedures and regulations that must be followed during the implementation of the block chain system are a significant deterrent to these companies.

## **6. Computer and Power Dependability**

The use of computers is required for block chain implementation. As a result, issues with computers, such as processing power and viruses, have a significant impact on the system. Computers, too, require energy. The systems' reliance on electricity makes them unreliable in the event of power outages or shortages. The majority of companies need systems that can withstand power outages. Making use of the block chain system would require the business to have a manual backup system.



## CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

### 5.1 Introduction

Chapter 5 summarizes the conclusions reached as a result of the previous chapter's observations, as well as the recommendations made in response. The report's findings and recommendations were based on the study's objectives, which included examining the primary benefits of blockchain technology as well as the implications of its use, blockchain adoption, and Blockchain challenges in finance. It also presents challenges faced during data collection.

### 5.2 Recommendations

**5.2.1 Research question one:** *What are the advantages of the use of blockchain technology in finance?*

As discussed per the research objective... To explore the key advantages blockchain technology offers. We are able to see the different advantages such as instant transactions, secure payment solution, improved capital optimization. As a result, blockchain technology has had a favorable impact on the banking sector. As a result of this benefit, Blockchain technology is unchangeable and indestructible. Users of the Blockchain have complete control over all transactions and information.

**5.2.2 Research question two:** *How does the use of blockchain technology affect the financial sector?*

In view of the study's goal...Blockchain has a huge impact on the financial sector, but all of this is still dependent on a few key criteria that play a role in successful deployment. All important vital success factors must be implemented to properly realize blockchain's impact on the financial sector.

**5.2.3 Research question three:** *How is Blockchain technology adopted in the financial sector?*

By incorporating unique services for Kenyan merchants, such as energy suppliers, bill payment, and payroll solutions, it is possible to build a structure that can accommodate small scale payments in all areas of financial lives. This is as discussed in the objective” To assess how Blockchain is adopted in financial sector” It will only be three to five years until blockchain is used in banking. According to a recent study in comparison to this research study, central banks and governments are investigating how to move money across borders instantly, within minutes

and seconds, by utilizing digital currencies on secure blockchains, transforming a global system that currently takes three to five days to complete transactions.

**5.2.4 Research question four:** *What are the challenges that blockchain technology adopters are still facing?*

According to this study blockchain technology is facing challenges like maintenance costs, data modifications, requirements for literacy, blockchain timeframe, blockchain rules and regulations and computer and power dependability. This is as discussed in the objective on the challenges of blockchain technology in the financial sectors.

The critical success factors identified for the adoption of Blockchain solutions within financial services and research departments are listed below. They need to be achieved to achieve a complete adoption of this technology.

#### **1. Enough capitals and good financial management**

The majority of interviewees agreed that firms contemplating Blockchain must have enough money to deploy it because it is expensive, and not all businesses can afford it in the long term.

In the financial services business, block chain adoption is gaining steam; it is a breakthrough that has revolutionized the global financial system, making it more safe and efficient. In a variety of ways, block chain technology is enhancing the global financial services industry. The most major benefit of block chain is "cross-border settlements.", It is the idea of leveraging block chain technology to construct a global network that is both cost-effective and potentially transparent. It reduces costs while also providing additional benefits to service seekers.

#### **2.Align the organization's activities with Blockchain initiatives.**

The key functions of the financial department should be in accord with the choice to use Blockchain technology (research or real services or both). Organizations that do not specialize in banking investment should stay away from this market. Sufficient energy and electrical supplies.

Blockchain will require a large consumption of electricity and abundant energy supplies can impose a requirement for using or adopting Blockchain.

## **2. Reliable high computational power**

Similarly, Blockchain will require high-end devices on par with supercomputers in order to perform hundreds or millions of calculations per second. If there is reliable high computational power with sufficient cooling, enough energy supply, and low risk of natural disasters and catastrophes, all transactions can be made safe and secure (e.g., fire).

## **3. Intelligent algorithms with mathematical complexity.**

Complex mathematics and high-end processing power are required to support blockchain. This also necessitates the use of clever algorithms that operate reliably every second behind the scenes.

## **5.3 Challenges faced during data collection**

Some of the challenges faced in this research is late or no replies from different financial sectors dealing with Blockchain technology and tediousness in replying the questions on the research.

## **5.4 Conclusion.**

The financial services industry is moving towards block chain adoption; it is an innovation that has revolutionized the global financial system and made it more secure and efficient. There are many ways in which block chain technology is enhancing the global financial service industry. The biggest benefit of block chain is "cross-border settlements", it is an idea of creating a global network through block chain that is highly cost-efficient and potentially transparent at the same time. It is driving the under cost and providing further values to the service seekers.

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IMPACTS OF BLOCKCHAIN TECHNOLOGY IN FINANCIAL SERVICES. (Interview questions part of a research study being conducted on the impacts of Blockchain technology in financial services.)

- 1.Adaptations of Bitsoko in Blockchain Technology?
2. Advantages of Blockchain Technology in Bitsoko?
3. How does Bitsoko employ use of Blockchain Technology?
4. What are the challenges Bitsoko has faced in Blockchain technology?