

Comparative Study of the Current Processes used by Insurance Companies and application of Block Chain Technology on Business Performance in Kenya

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Abstract: *The insurance industry has been engaging in numerous processes which are characterized by the exchange of data updated by multiple parties, they have ramped up investments in their digital agenda to be at par with other industries. However, despite of such enormous investments, thousands of fraud cases have been reported and many more could have gone unreported on the same platforms intended to increase efficiency. Blockchain, as a single source of truth, has the potential to increase transparency, efficiency and reduce the complexity of these processes. This research was carried out to compare the current processes used by insurance companies and influence of block chain technology on business performance in Kenya. The specific objectives of the study were; To establish the procedures used by insurance companies in Kenya; to establish the challenges of the current processes used by insurance companies on business performance; to establish the level of awareness in insurance companies on block chain technology on their business performance and to establish the awareness of the benefits of block chain technology on business performance of insurance companies. The study was descriptive in nature, both qualitative and quantitative data was collected. Stratified random sampling technique was used to select 16 companies out of the 52 insurance companies registered in Kenya, based on their domain of operation. The findings of the study were; there is no common procedures for all insurance companies in Kenya even those operating in the same domain; communication between clients and company, verification of payment details, misappropriation of clients' premiums, missing records of payments, legal reporting systems are the key challenges facing receiving and making client's payment; Lack of transparency between the parties involved in receiving payments, management misunderstanding, legal reporting systems fraudulent transaction, presentation of fictitious claims, provision of correct information/data, communication between the client and the company, misappropriation of clients' payments, missing record of payment, verification of payment details are the risks involved in making payment to clients. Most organizations are aware of block chain but have not implemented it in their processes. The following were identified as the key benefits insurance companies can enjoy by adopting block chain technology; reduce fraud; fasten claim settlements; increase transparency among parties; increase data security and integrity; increased speed of digitization and reduce back end tasks. There is need for policy guideline on operations of insurance companies. The study recommends further research to be done on challenges that insurance companies face in adopting block chain technology.*

Keywords: Block chain, Insurance industry, Business performance, smart contract

1. Background Information

Technological changes pose new challenges and generate further opportunities for firms. In particular, innovative technologies have the potential to modify the equilibrium among the firms in an industry. Leading firms consistently fail to stay at the top of their industry when technological discontinuities occur (Christensen 2015)

During the last years, the financial services sector has gone through far-reaching changes partly due to the recent financial market crisis. Nowadays, the move toward digitalization of processes and products is further pushing banks and other financial institutions to rethink their strategies, business models, and operations. The advent of new technologies, combined with a decline in margins and the rise of new competitors, are pressuring incumbent companies to find viable solutions that would allow them to cope with the new environment.

It is under this scenario that especially a technology named blockchain is attracting the attention of the actors in the financial sector for its potentially revolutionary enhancements of operations and financials. According to Roßbach (2016), blockchain technology stands for a radical

shift to direct transactions between end parties without current intermediary services building on a consensus mechanism to verify new transactions, and a decentralized record keeping of all transactions.

Blockchain is a type of business process management but it makes a revolution in the management of processes as a study in optimization execution (Mendling 2018). It does not require any authority reverse a central mechanism. It relies on a distributed node for sharing data on the network. A consensus is required to achieve it on the network for each participant. In Bitcoin concurrency application, there is a function to deduce a consensus that is called a Proof of Work function (Kevin, 2016). This strategy requires that any node wishing to add a block to the blockchain must complete a computationally expensive (but easily verifiable) puzzle first

Blockchain is a new technology with potentially disruptive power, which yields implications for a number of industries (Bilgeri 2016). First applications arose in the financial services sector with bitcoins (Nakamoto, 2008), which puts the payments industry at the center of innovations around blockchain technology.

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In a survey carried out by deloitte in 2019, it was realized that fifty percent of the respondents said that blockchain technology has become a critical priority for their organization, a 10 point increase over 2018. The countries surveyed include Brazil, Canada, china, German, hongkong, Israel, Luxemburg, Singapore, Switzerland, United Arab Emirates, united states, United Kingdom. Germany has been using block chain technology for several years. In 2019, Germany released a national blockchain strategy, to regulate finance-related tokens which include securities, money, crypto assets, stable coins. These upcoming new rules could provide legal framework for the industries that require use of block chain technology (Sandner, 2019).

By use of blockchain in Germany, insurers have the potential to dramatically reduce operating costs by automating the manual tasks involved in requesting, exchanging and entering data in areas such as underwriting, claims and reinsurance. Automating these manual tasks on a blockchain platform will also speed processing, improve data quality, reduce fraud and provide real-time transparency into the status of transactions for all involved.

China is actively embracing blockchain, an underlying technology with a wide range of applications, and sees it as the new frontier of innovation in industries ranging from finance to manufacturing and energy. Industry experts and entrepreneurs believe that government support for blockchain will significantly drive the future development of the industry, and they say more efforts are needed to regulate the market and cultivate talent. (china daily November 2019).

In California, several companies have been drawn to, and offer flight-delay insurance, and options also currently exist for blockchain based crop insurance, weather insurance and medical insurance for gestational diabetes. Although most of these initiatives are European-based, Singapore also boasts new blockchain-based parametric insurance programs. (Laura et al, 2018). Use of block chain technology enables transactions to be conducted, recorded in sequence in the digital ledger and in 'blocks' that are then tied together into a blockchain. Since the system relies on references to other blocks that are cryptographically secure within the digital ledger, it is almost impossible to falsify. Most observers therefore believe the system to be immensely more trustworthy and transparent than traditional approaches to sharing data across a value chain or even within an enterprise.

Blockchain is a decentralized transparent ledger with the transactions records, the database that is shared by all network nodes, updated by miners, monitored by everyone, and owned and controlled by no one. It is like a giant interactive spreadsheet that everyone has access to and updates and confirms that the digital transactions transferring funds are unique. (Swan, 2015). Block chain technology has a lot to offer in the hailing insurance industry in Kenya. It will lower the operational costs as well as improve transparency and trust. The advantages are not limited to the following:

The *need for a trusted third party* is eliminated, as the blockchain protocol describes how consensus on the validity of a transaction is reached. Transactions in a blockchain are unique and are authorized by linking a digital signature to an identity.

Controllability of data is improved by linking transactions to each other and establishing an immutable "single source of truth", which is shared in a peer-to-peer network. Regulators could monitor this audit trail in near real-time, which could reduce the costs of regulatory compliance.

It is *not necessary to (manually) compile data*, the risk of errors is reduced, transactions are settled quickly and do not require arbitrage, which makes risk management less difficult and improves liquidity.

Blockchain offers *high resiliency*, as it does not depend on central infrastructure. It will continue to work in case of local system failures.

Blockchain facilitates the use of "*smart contracts*", these contracts execute predefined lines of computer code when certain conditions are met.

Like other countries in the world, Kenya stands to benefit to a large extent by adopting block chain in insurance based transactions to increase transparency, reduce fraud, increase efficiency and customer confidence, thus positively affect product uptake and growth of the industry.

2. Problem Statement

Regulation of the industry has seen bankrupt companies continue to operate despite measures taken to improve the sector (Ndegea 2019). Some companies are facing a myriad of legal suits from service providers or claimants.

Fraud in the sector has made the industry very unattractive to would-be entrants in the field. As a result, people who would have brought extra knowledge and expertise in the field are shut off, condemning it to its doom. It also has a way of rising insurance premiums by up to 20 percent according to Rotich (2019). Trust in the industry is at its lowest since insurance started in Kenya in the early 20th Century. Claims are not being paid on time, service providers are not getting their invoices honored, agents are not receiving their commissions on time or at all (Rotich 2019). It is not clear in literature the processes that are used by insurance companies and how the insurance companies benefit from them to remain in business.

Block chain technology has the capacity to minimize challenges faced by organizations in processing data. Blockchain, as a single source of truth, has the potential to increase efficiency and reduce the complexity of these processes (Valentina, 2018). It could result in disintermediation as it reduces the need of data reconciliation for insurance contracts and resolving disputes. Auditability is improved as it could provide regulators with real-time information on financial activities and fraud could be reduced by providing a full transaction history and asset provenance (Valentina, 2018).

This calls for a need to find out the challenges faced by insurance companies and the processes applied. This research has sought to compare the benefits of the current processes used by insurance companies and the opportunities provided by block chain technology.

3. Research Objectives

3.1 General Objective

The general Objective of this study was to compare the Current processes used by insurance companies and influence of block chain technology on business performance in Kenya.

3.2 Specific Objectives

The following were the specific objectives of the study

- 1) To establish the processes used by insurance companies in Kenya.
- 2) To establish the challenges of the current processes used by insurance companies on business performance.
- 3) To establish the level of awareness in insurance companies on block chain technology on their business performance.
- 4) To establish the benefits of block chain technology on business performance of insurance companies.

4. Literature Review

Recently, blockchain and its relations with smart contracts has received increasing attention from media. According to Palychata (2016), blockchain is compared to inventions such as the steam or combustion engine, since it is potentially able to bring benefits to a variety of everyday activities and business processes.

Advantages of blockchain are various. A number of enthusiasts already proposed using this technology in various sectors and contexts, including: Government to record in a transparent way citizens' votes, or politicians' programs or to enable autonomous governance systems (Huckle 2016); Intellectual property to certify the proof of existence and authorship of a document (de la Rosa 2016); Internet to reduce censorship, by exploiting the immutability of data stored in the blockchain (Lee 2016); Finance to transfer money between parties without having to rely on banks (Treleaven, 2017); Commerce to record goods, characteristics as well as their ownership, especially for luxury goods, thus reducing the market of counterfeit/stolen items (Kim 2016); Internet of Things (IoT) by exploiting smart contracts to automatically process data coming from sensors, in order to let intelligent machines interact with each other and autonomously take actions when specific situations occur (Hong, 2017);

Education, to store information on qualifications acquired by learners, e.g., to reduce job application frauds; in this context, multiple actors could write qualifications achieved by a person on the blockchain; human resources staff could then easily obtain information about when and where a given competency was obtained (Sharpless 2016).

Looking more specifically at application of blockchain technology in the insurance industry, a survey done by Mckinsey&Company (2016) revealed Block chain's potential use cases for the insurance industry,

"We see three ways in which blockchain can facilitate growth for insurers: improving customer engagement, enabling cost-efficient product offerings for emerging markets, and enabling the development of insurance products related to the Internet of Things. Fundamental to the potential that blockchain offers in these areas is its usage as a distributed and reliable platform for customer-controlled personal data, peer-to-peer (P2P) insurances, and smart contracts"

According to the Mckinsey & Company (2016) survey, an estimated 5 to 10 percent of all claims are fraudulent. According to the FBI, this costs US non-health insurers more than USD 40 billion per year. To more effectively detect identity fraud, falsified injury or damage reports, etc., blockchain can be used as a cross-industry, distributed registry with external and customer data to validate authenticity, ownership, and provenance of goods as well as authenticity of documents such as; Check for police theft reports/claims history as well as a person's verified identity, Detect patterns of fraudulent behavior related to a specific identity, Prove date and time of policy issuance or purchase of a product/asset, Confirm subsequent ownership and location changes.

However, to achieve blockchain-specific benefits from these applications beyond what is possible with traditional database solutions and existing forms of cooperation like via industry associations, intensive cooperation between insurers, manufacturers, customers, and other parties is necessary.

Despite of the enumerated benefits of block chain technology, there has been no specific use case in African countries to evaluate the uptake or the perception of block chain in the continent. From the available literature, there has been several reported use cases of block chain in other industries like banking, supply chain and medicine. This study therefore Compared the current processes used by insurance companies and investigated the application of block chain technology and how it can affect business performance in Kenya.

5. Conceptual Framework

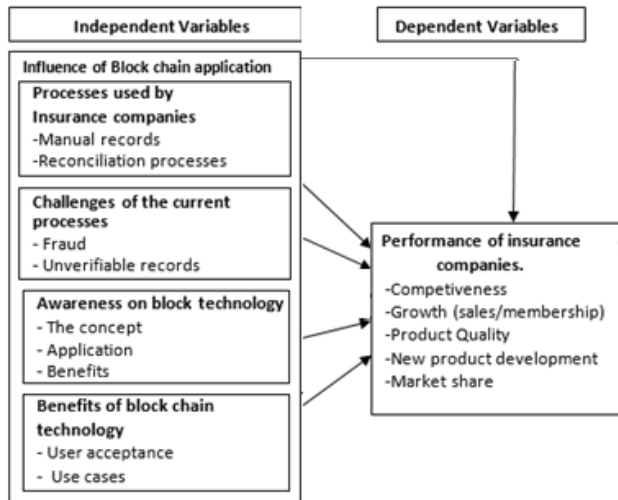


Figure 1: Conceptual Framework

6. Research Methodology

The study was descriptive, stratified random sampling technique was used to select 16 companies out of the 52 insurance companies registered in Kenya based on their domain of operation. A standard questionnaire was used to collect primary data from each of the selected insurance companies. Measures of frequency and percentages were recorded. The data was analyzed by use of computer statistical packages and data presented in tables and figures.

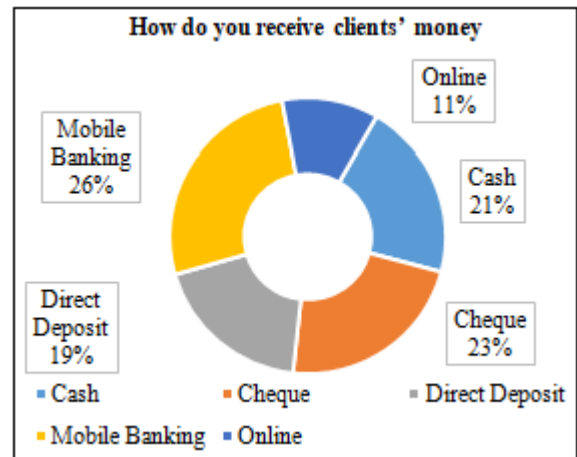
The questionnaire was administered to either the head of ICT/service innovation or the operations manager in each of the 16 sampled companies. The intention was to capture the technical and managerial perspectives of the block chain technology in the sampled companies.

6.1 Data analysis

From the survey 73% of the persons heading ICT had joined the organization in less than 10 years. This indicates that ICT departments have not existed for a long time in most of the organizations.

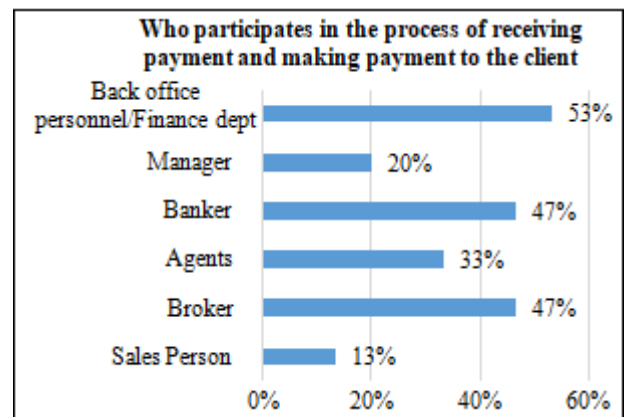
Social insurance, personal insurance, property insurance and fire insurance are the highly covered risks at 80% from the respondents while social insurance is the least covered. 40% of the companies have more than 50,000 clients, as indicated in Figure 4. This indicates that the industry is robust. In many organizations, payments are received by the cashier. Only in very few cases are they received by the manager, mostly in the small companies.

Mobile banking, direct deposits, cheque and cash payments are the methods through which the insurance companies receive money from their clients. The least is online banking.



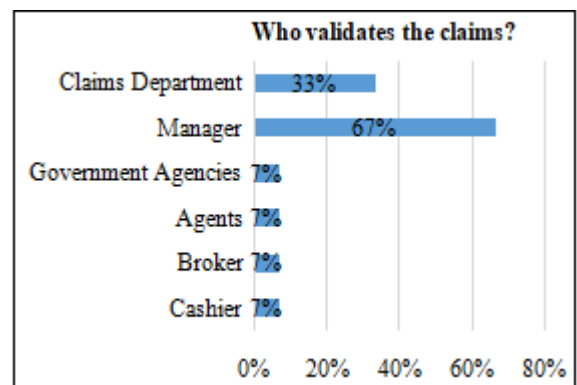
Methods of receiving money among the respondents

73% of the respondents were in agreement that there is a risk in receiving payments from clients. There are equivalent risks in making payments too, 67% of the respondents stated so. Back office personnel/finance office 53%, banker 47%, brokers 47% and agents 33% are majorly the ones who participate in receiving money and making payments.



Participants in receiving and making payments among the respondents

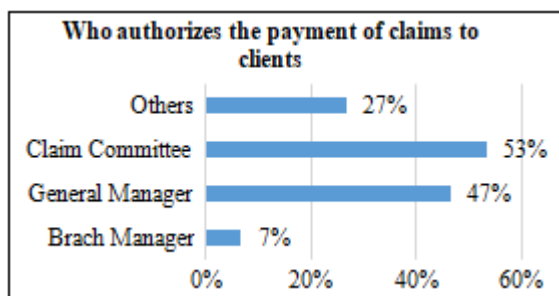
Payment validation is majorly done by the manager, in some cases there are claims department who handle that but to a smaller extend Government agencies, agents, brokers and cashier are also involved based on the kind of policy in question.



Validation of claims among the respondents

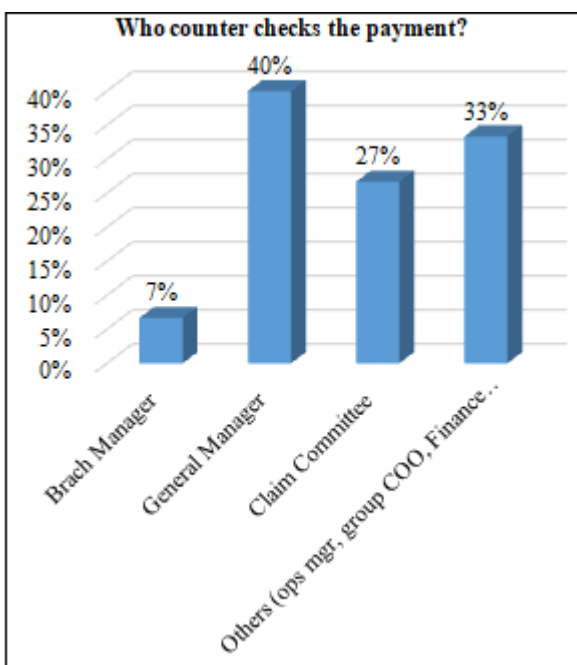
In most of the organizations, there are claims committee 53%, who authorizes payment of claims to clients while in

other cases, it is the general manager 47% who authorizes. For the smaller companies, the branch manager 7% or other officers do the authorization.



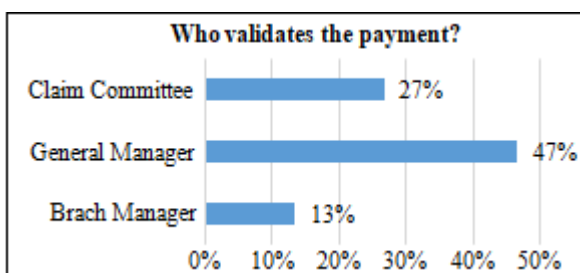
Authorization of clients' claims

The general manager also counter checks the claim payment in 40% of the respondents. In other cases, it's the credits officer, or finance department, HOD or MD33%. In 27% of the respondents, it is the claims committee which counter checks while in few cases 7%, the branch manager counter checks, 7%.



Counter checking of payments

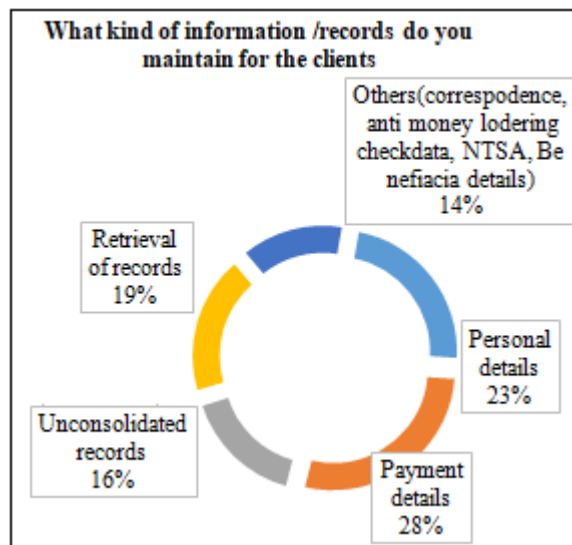
47% of the respondents reported that the general manager validates payments while in 27%, the claims committee does it while in 13% the approval is done by the branch manager.



Validation of payments

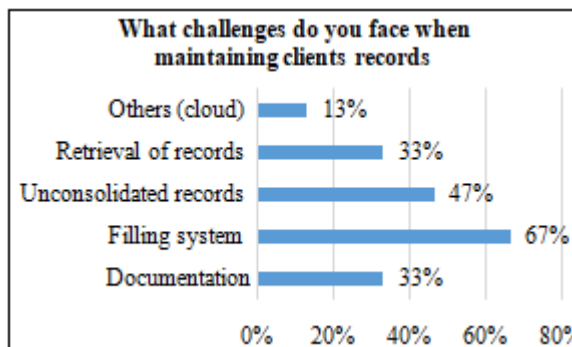
Payments details make the biggest information that is maintained for the client at 28%, personal details at 23%,

retrieval records at 19%, unconsolidated records at 16% and other correspondences at 14%.



Clients records/information maintained by the company

Filing system is the biggest challenge in management of client records, as reported by 67% of our respondents. Followed by unconsolidated records 47%, documentation 33%, and retrieval of records 33% and assorted others 13%.



Challenges faced when maintaining clients records

While receiving client's payment, the challenges faced were reported as communication between clients and the company 67%, verification of payment details 67%, misappropriation of clients premiums 53%, missing records of payment 33% and legal reporting system.



Challenges faced when receiving client's payments

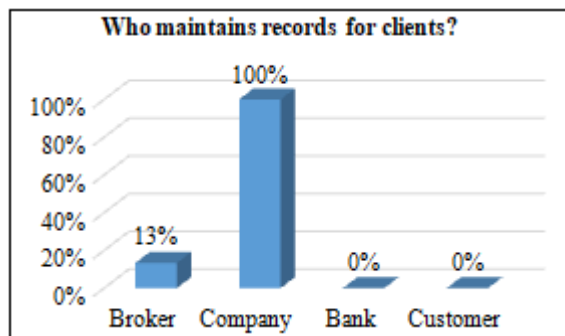
While making transaction to clients, the biggest risk is fraud at 73%, followed by presentation of fictitious claims 60%, legal reporting systems 53%, and misappropriation of client

premiums 47%, presentation of incorrect data 47%, missing record of payments 47%, verification of details 33% and lack of transparency between the parties 33%.



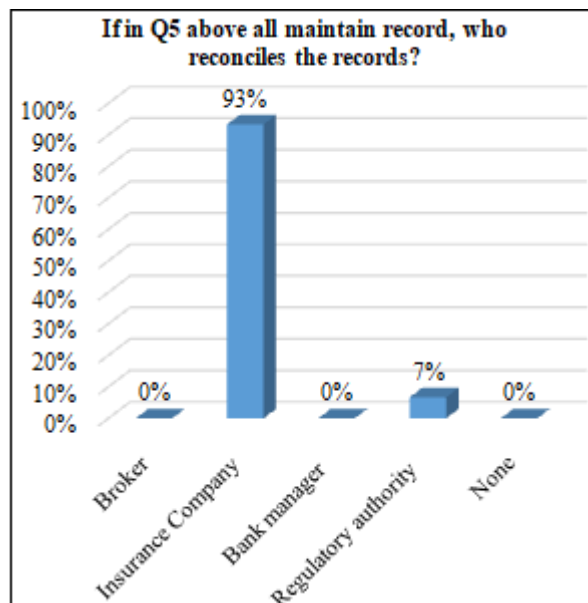
Risks involved in making payments to clients

The respondents reported that they maintain all client records, 100% though in other cases, the broker also maintains the same records 13%. The bank and customer don't maintain the same. Figure 18



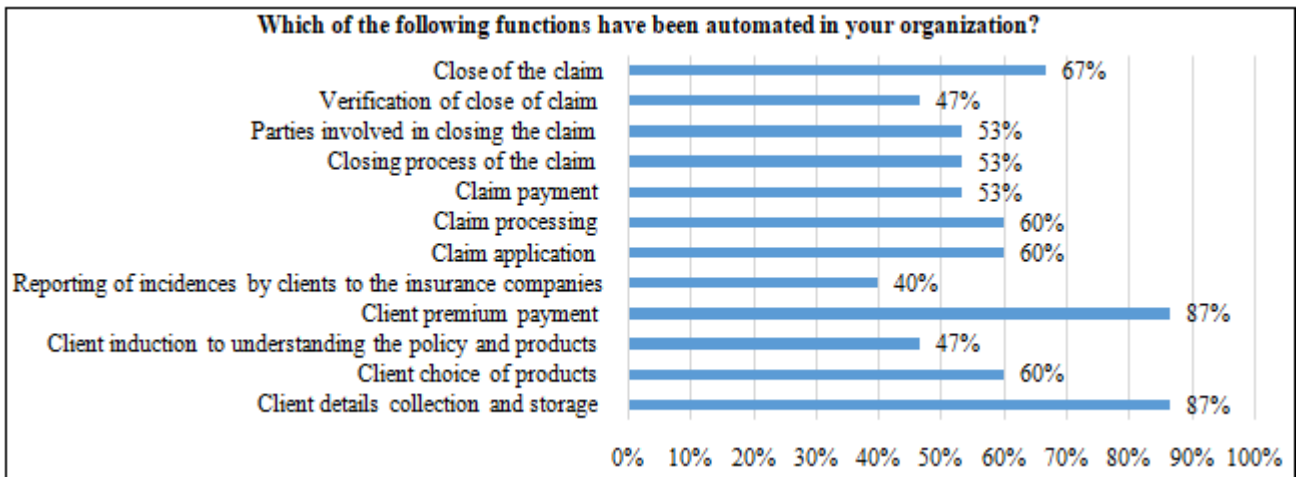
Maintenance of records for clients

As per the respondents, all records are reconciled by the insurance company 93% although 7% report that their records are reconciled by the regulatory authority.



Reconciliation of clients' records

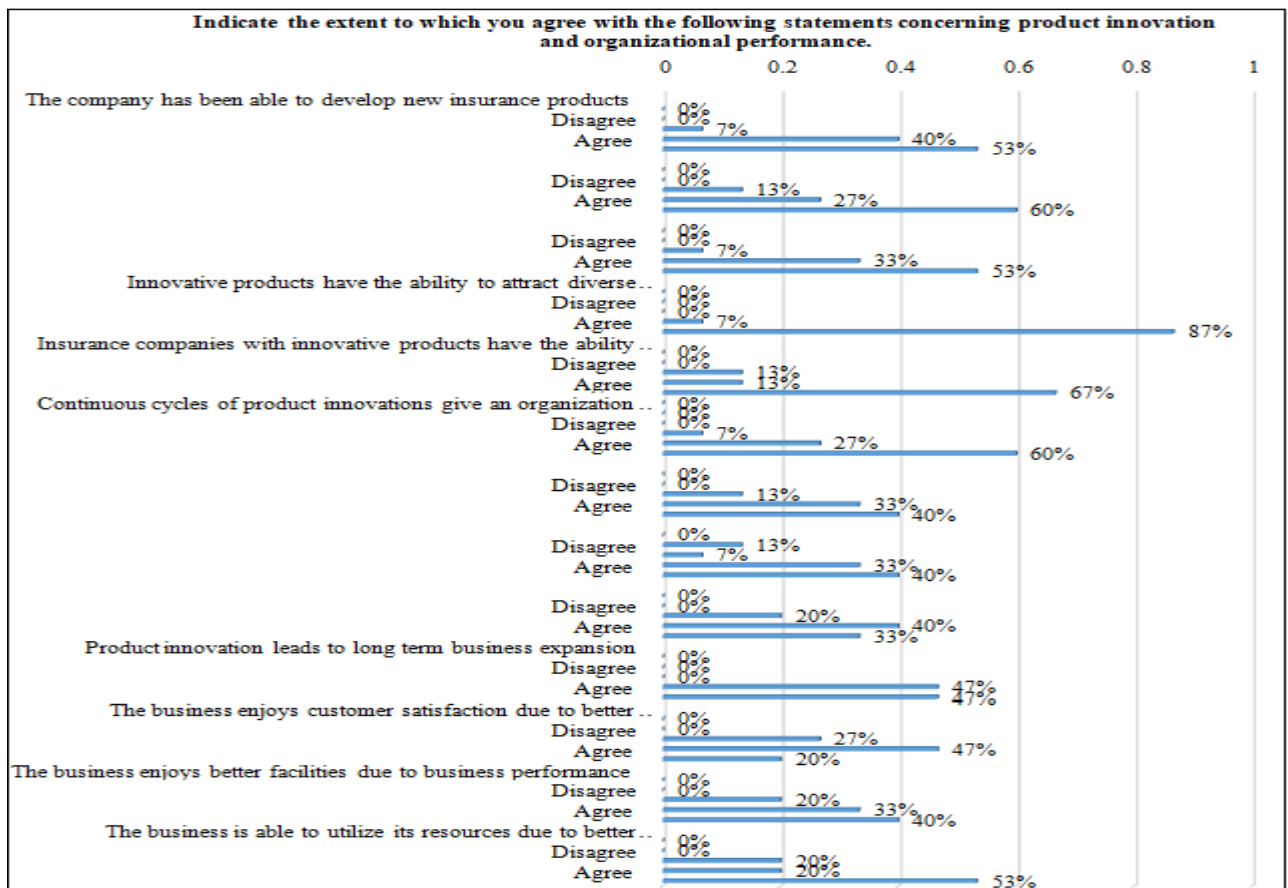
Client premium payment and client details collection and storage are the most automated, both at 87%, followed by close of claim 67%, client choice of product 60%, claim application 60%, claim processing 60%, claim payment 53%, closing process of the claim 53%, parties involved in closing the claim 53%, verification of close of claim 47%, client induction to understanding the policy and products 47% and reporting of incidences by clients to the insurance company.



Automated functions in the organization

Majority of the respondents strongly agree with the following concerning innovation and organizational performance.

- a) The company has been able to develop new insurance products 53%
- b) The Company has developed new Information management processes 60%
- c) The company has been able to develop new systems that lead to better service delivery. 53%
- d) Innovative products have the ability to attract diverse consumers with varied needs. 87%
- e) Insurance companies with innovative products have the ability to retain customer loyalty 67%
- f) Continuous cycles of product innovations give an organization competitive advantage 60%
- g) Innovative insurance products have high success chances regardless of the insurance firm that launches the product 40%
- h) Additional features to a product improve the quality of the product 40%
- i) Successful product innovation is deterred by the rules and guidelines of the Insurance Regulatory Authority 33%
- j) Product innovation leads to long term business expansion 47%
- k) The business enjoys customer satisfaction due to better performance 20%
- l) The business enjoys better facilities due to business performance 40%
- m) The business is able to utilize its resources due to better business performance 53%



Product innovation and organizational performance

The respondents identified the following as the ways in which block chain will benefit business operations to a big extend.

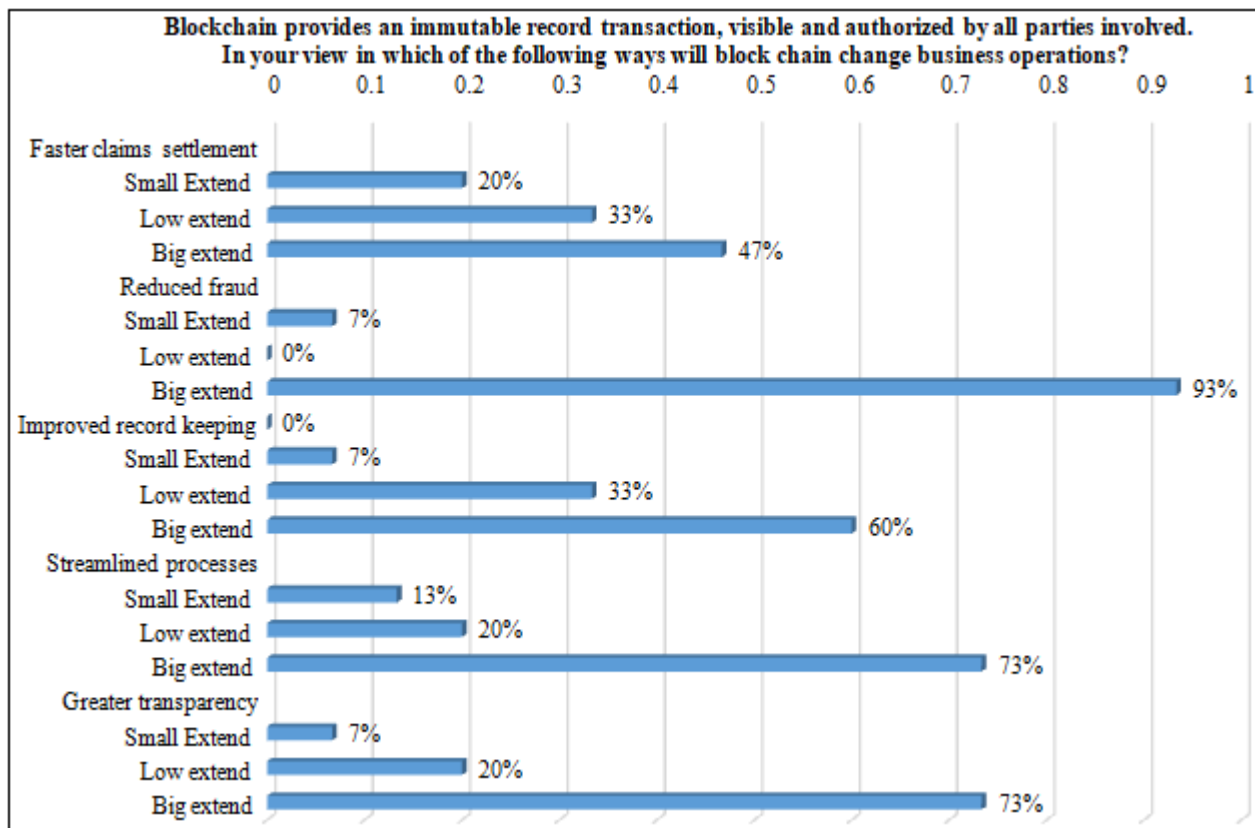
a) Faster claims settlement 47%

b) Reduced fraud 93%

c) Improved record keeping 60%

d) Streamlined processes 73%

e) Greater transparency 73%



Ways in which block chain will change business operations.

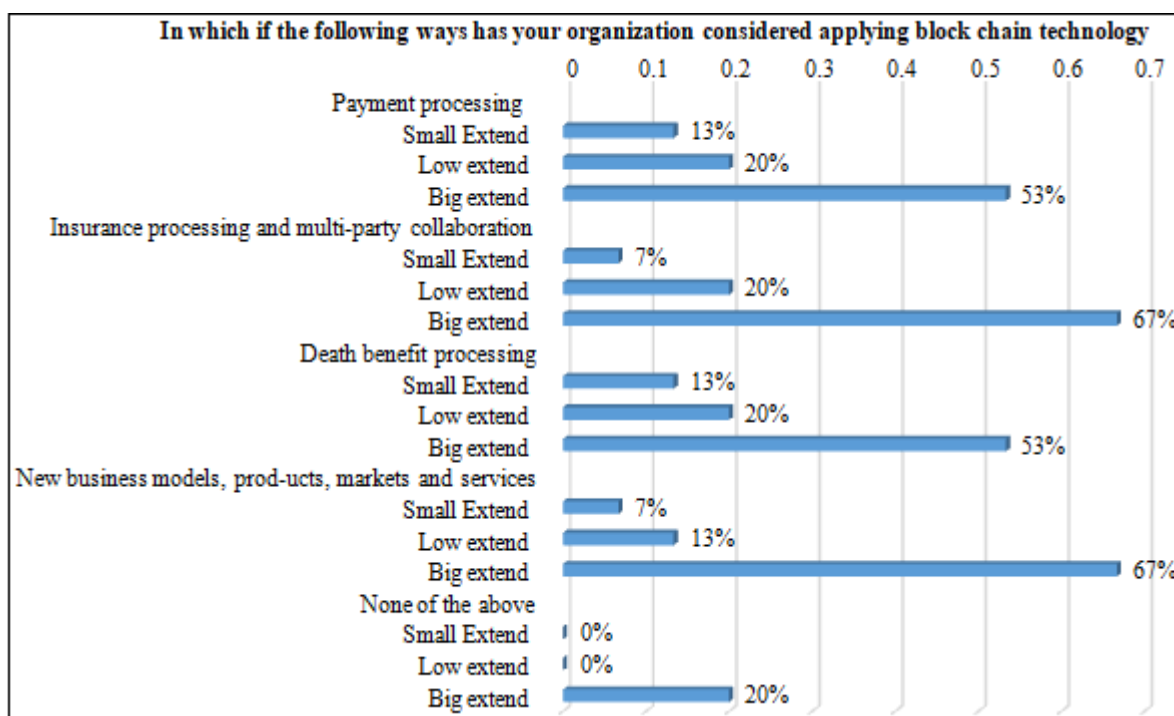
The respondents have considered applying block chain technology in the following areas to a big extend

a) Payment processing 53%

b) Insurance processing and multiparty collaboration 67%

c) Death benefit processing 53%

d) New business models, products, marketing and services 67%



Ways in which organizations consider applying block chain

The top five benefits of adopting block chain in insurance based organizations were identified as follows;

a) Reduce fraud 93%

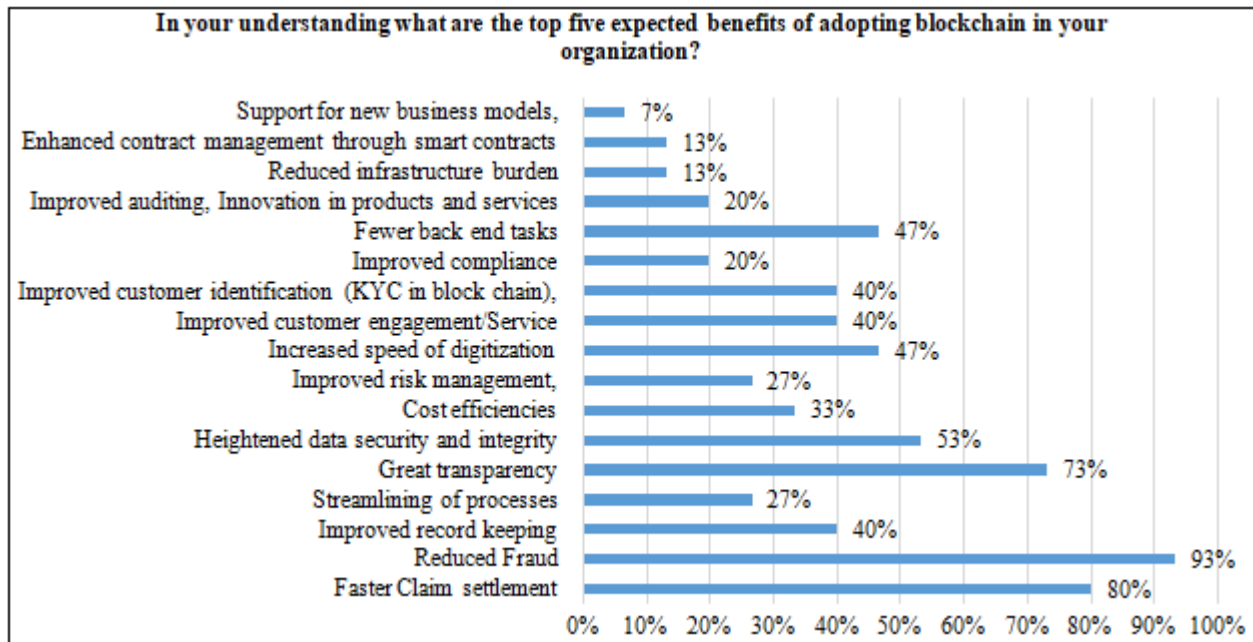
b) Faster claim settlement 80%

c) Great transparency 73%

d) Heightened data security and integrity 53%

e) Increased speed of digitization 47%

f) Fewer back end tasks 47%



Top six benefits of adopting block chain in business organizations.

The top seven barriers to adoption of block chain in the insurance industry were identified to be:

a) Credibility/ Mistrust of block chain 80%

b) Skills gap 67%

c) Mistrust among the players 60%

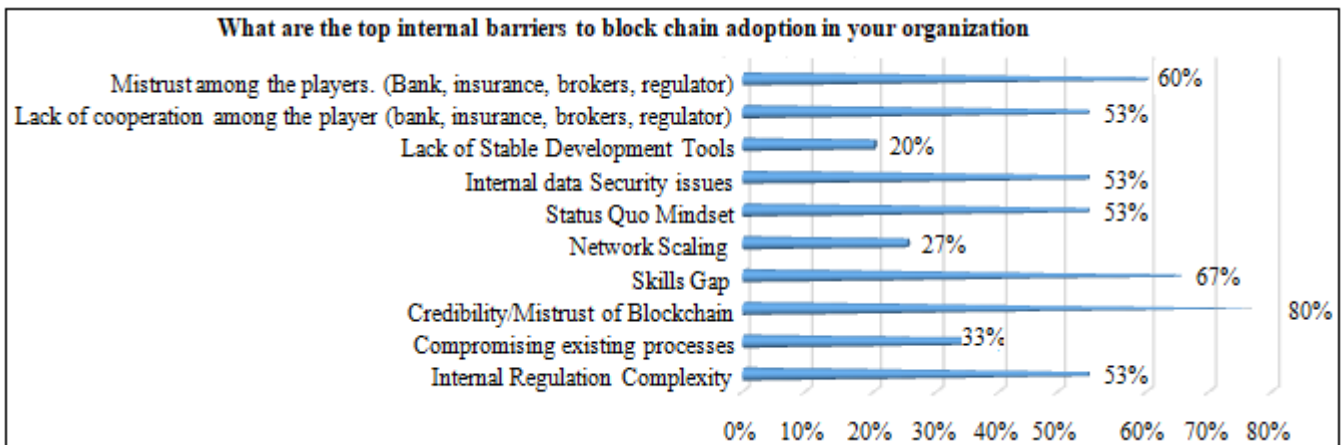
d) Internal regulation complexity 53%

e) Status quo mindset 53%

f) Internal data security issues. 53%

g) Lack of cooperation among the players 53%

As shown in figure 25



Top barriers to bock chain adoption in insurance companies

Out of the respondents, 47% have implemented block chain technology in one way or another while 53% have not as

shown in figure 26. 60% of those organizations have plans to implement block chain

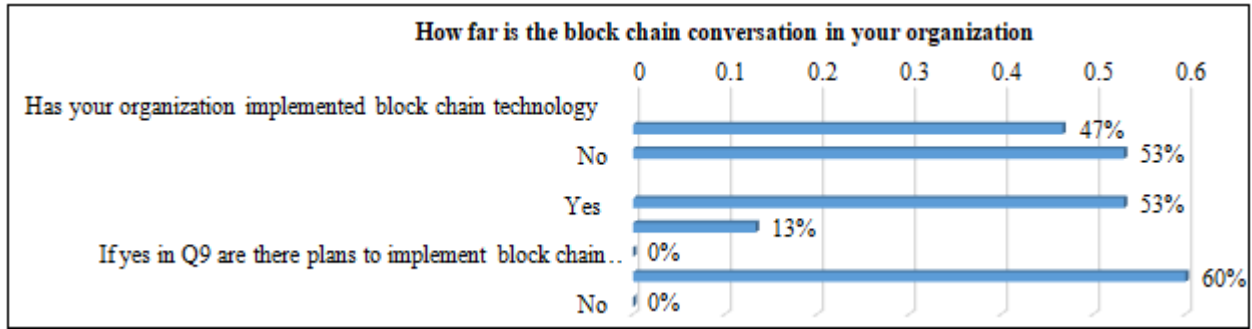
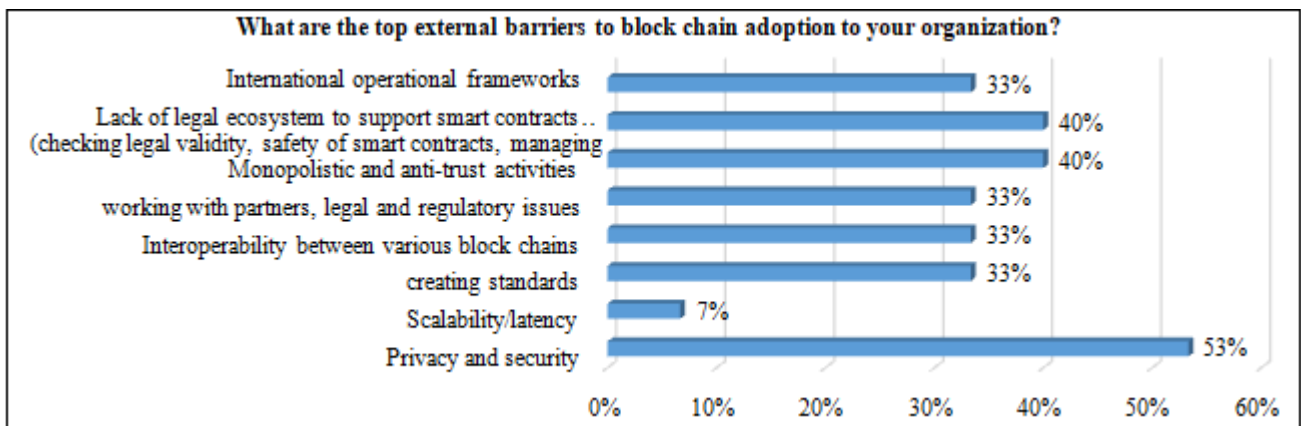


Figure 2: Organizations which have implemented block chain technology

The top three internal barrier to adoption of block chain as per the respondents are;

- a) Privacy and security concerns 53%
- b) Monopolistic and ant-trust activities 40%
- c) Lack of legal ecosystem to support smart contracts 40%

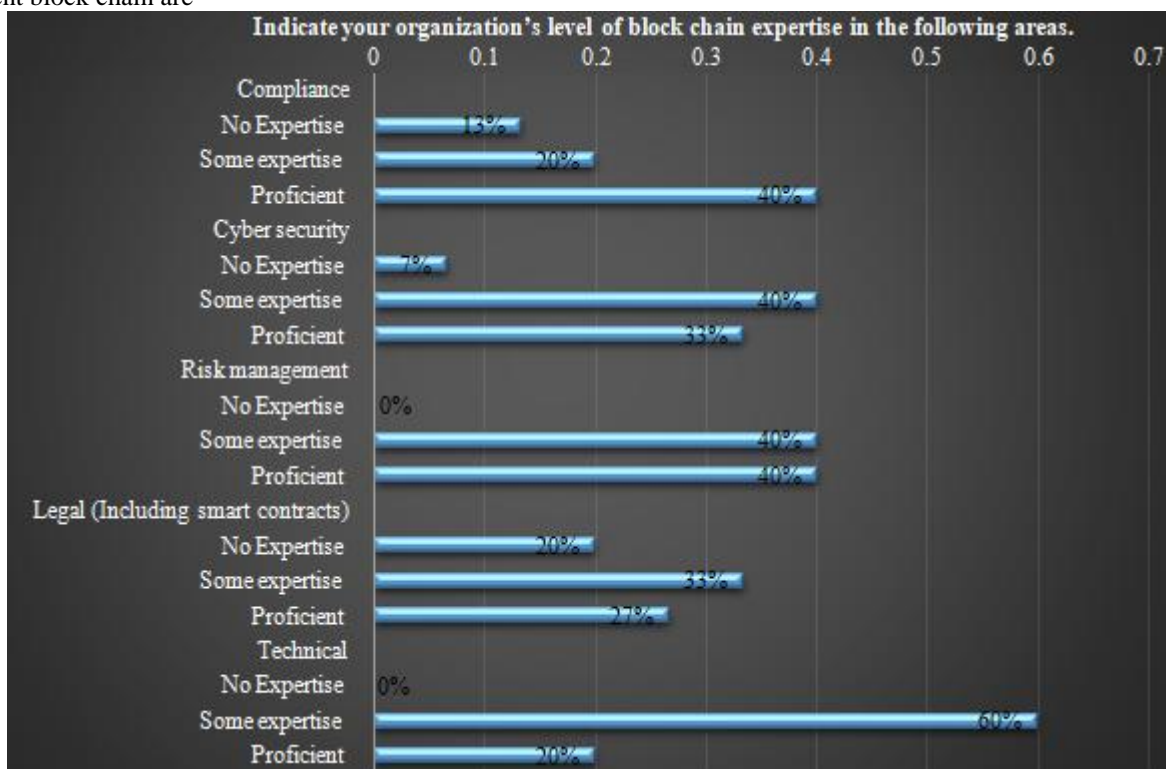
As shown below, scalability/latency is not a significant barrier to block chain adoption in insurance companies.



Top external barriers to block chain adoption to insurance organizations

Some of the areas where expertise is lacking to support and implement block chain are

- a) Cyber security
- b) Legal issues
- c) Technical proficiency

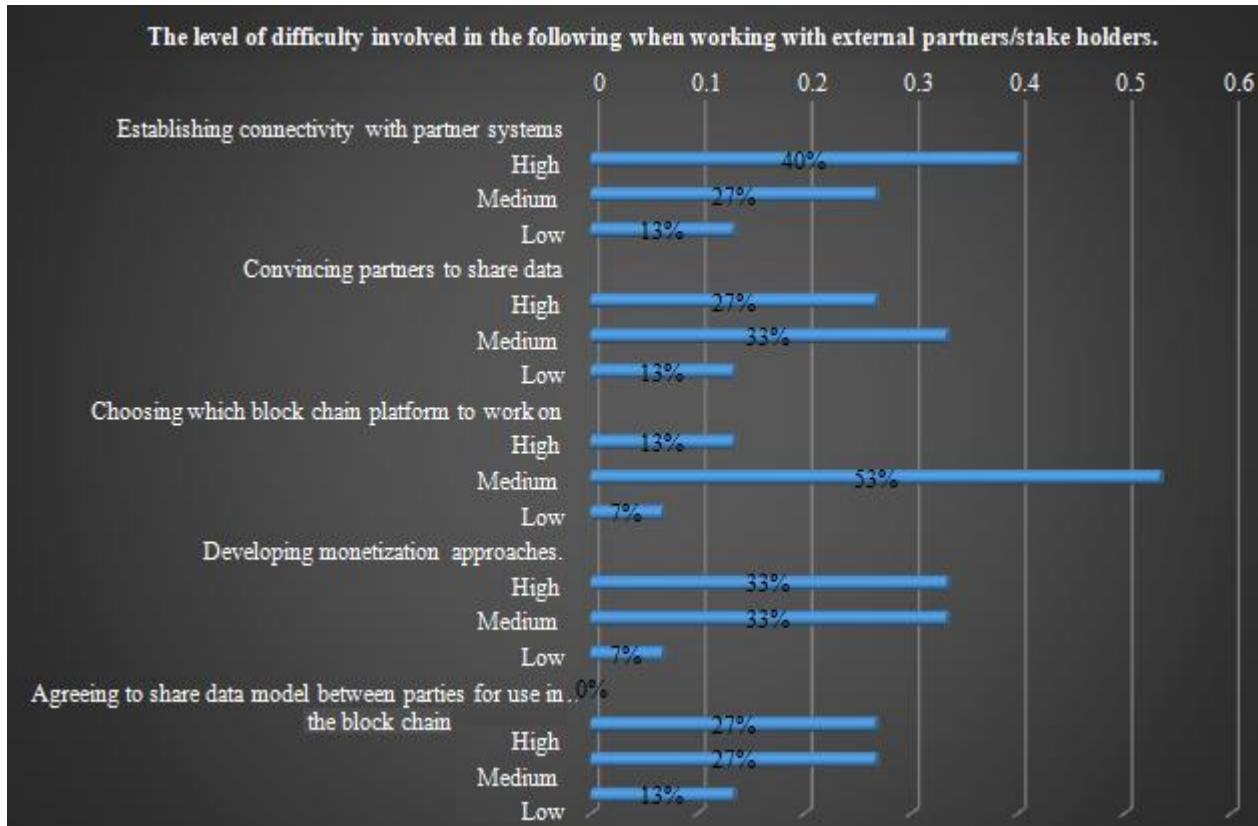


Level of block chain expertise in various areas

The respondents, experience the following difficulties while working with external partners and stake holders.

- a) Establishing connectivity with partner systems
- b) Convincing partners to share data.

- c) Developing monetization approaches
- d) Agreeing to share data model between parties for use in the block chain
- e) Choosing which block chain to work on



Difficulties experienced when working with external partner's/stake holders

7. Findings

The study found out that ICT departments in the insurance companies are quite young, Ten year of existence. This means that most of the information has been kept in hard copies not soft copies.

It was realized that the following types of products are offered by the insurance companies Social insurance, Guarantee insurance, Fire insurance, Marine insurance, Property insurance, Personal insurance and Life insurance. The most common products are fire, property, personal and life at 80%. This confirms that insurance companies offer similar products and customers understand the importance of the products.

The number of clients in all the insurance companies was quite high ranging from 1-50,000 with above 50,000 members being the majority. This confirms that most Kenyans have invested in the insurance industry and there is need to protect the industry.

It was realized that in most of the organizations, it's the cashier who receives payments, 73% followed by sales persons 47%, Brokers 40% and managers 13%. The managers have minimal control of the payments received. This implies that there is limited coordination of receipts. Online banking is least utilized across all insurance

companies. The systems in the insurance companies hardly guide on how reconciliation of payments are done. Most customers believe in insurance cover given, which gives them confidence to have made the payments.

It was established that the risk involved in receiving payments from clients is very high at 73%. This indicates that there is need to address the risk factors in receiving payments in insurance companies. There is need for a policy to guide on receiving payment by insurance companies.

In making payments, the study found out that, managers and the claims department play a key role in making payments. Claims committee authorizes payments which are validated by the managers of head offices 67%, who also counter checks the payments 40%.

In maintaining payment records, the company maintains personal details and payment details. Other stake holders do not maintain similar records. The insurance company is therefore the sole provider of data of the client for any transaction carried out.

The following challenges are being faced in maintaining client records. Filling system, unconsolidated records and retrieval of records. This indicates that client documentation is well managed.

Communication between clients and company, verification of payment details, misappropriation of clients' premiums, missing records of payments and legal reporting systems are the key challenges facing receiving of client's payment. This puts both the client and the organization at risk.

Lack of transparency between the parties involved in receiving payments, management misunderstanding, legal reporting systems fraudulent transaction, presentation of fictitious claims, provision of correct information/data, communication between the client and the company, misappropriation of clients' payments, missing record of payment, verification of payment details are the risks involved in making payment to clients. The highest being fraudulent transactions 73% followed by presentation of fictitious claims 60%.

Clients records are maintained by insurance company, with very minimal percentage maintained by the broker. The other stake holders don't maintain the clients' records. It implies that whenever they need any records about the client, they can only get it from insurance company. It was also reported that the insurance company reconciles the clients' records.

The following functions have been automated by the insurance companies.; Client premium payments, clients details-collection and storage, close of claim, claim processing, claim application, parties involved in closing the claim, processing of the claim, claim payment, among others. This is a very positive move by the insurance companies, hence need to make use of the automated system and share the same information with other stake holders.

Majority of the respondents strongly agreed that innovation was improving organizational performance as the following was taking place; new insurance products were being developed, new Information management processes were in place, better service delivery was being achieved through new systems development, varied customer need are being met through innovative initiatives, customer loyalty was being improved through innovation, competitive advantage in the market was being achieved due to innovative products, Product innovation leads to long term business expansion, businesses enjoys customer satisfaction due to better performance.

The study established the following benefits of using block chain technology in business performance; Faster claim settlement, reduced fraud, improved record keeping, streamlined processes and greater transparency among others.

From the study, the following five benefits of using block chain technology were identified to be key in improving performance of the business. Reduced fraud, faster claim settlements, great transparency, data security and integrity, increased speed of digitization, fewer back end tasks.

The study established the following barriers to adoption of block chain in the insurance industry; credibility/mistrust of block chain, skills gaps, mistrust among players, internal

regulations complexity, status quo mindset, internal data security issues, lack of corporation among players.

The following three internal barriers to adoption of block chain were identified. Privacy and security concerns, monopolistic and anti-trust activities and lack of legal ecosystem to support smart contracts. The following external barriers to adoption of block chain technology by insurance companies were identified as follows; cyber security, legal issues and technical proficiency.

The study found out that the following difficulties were being faced by insurance companies while working with external partners and stake holders; establishing connectivity with partner systems, convincing partners to share data, developing monetary approaches, agreeing to share data model between parties for use in the block chain and choosing which block chain to work on.

8. Conclusion and recommendation

Information Communication Technology (ICT) is a young in implementation in insurance companies. More has to done in adopting ICT. Insurance is a very busy industry and many Kenyans have invested in it.

There is a need for a policy to guide the operation of insurance companies regarding receiving payments from clients and making payment to clients. This will minimize transaction risks in the industry.

Documentation is a big challenge in the industry and an area of improvement for the insurance companies. There is need to involve the stake holders in maintenance of records in the insurance industry. Use of block chain technology will be of great use in solving this problem.

Automation is taking place among insurance companies, which is a great improvement to the performance of the organization. The information gathered through the automation can be better utilized through block chain technology. The technology will enhance data sharing, reduce fraud, sped up claim settlement and increase transparency.

For the cloud technology to be adopted and utilized in the industry, there is need for further research on the following areas; modalities of establishing connectivity with partner systems, methodologies and logistics of sharing data among stake holders and models on data sharing among partners.

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