

# Factors Determining Adoption of Block Chain in the Insurance Industry: A Case of Kenya

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**Abstract:** *Blockchain is receiving increasing attention from academy and industry, since it is considered a breakthrough technology that could bring huge benefits to many different sectors. In 2017, Gartner positioned blockchain close to the peak of inflated expectations, acknowledging the enthusiasm for this technology. In this scenario, the risk to adopt it in the wake of enthusiasm, without objectively judging its actual added value is rather high. Insurance is one the sectors that, among others, started to carefully investigate the possibilities of blockchain. For this specific sector, however, the hype cycle shows that the technology is still in the innovation trigger phase, meaning that the spectrum of possible applications has not been fully explored yet. Insurers, as with many other companies not necessarily active only in the financial sector, are currently requested to make a hard decision, that is, whether to adopt blockchain or not, and they will only know if they were right down the years. This study seeks to establish the factors which determine successful adoption of block chain in the insurance industry. The study is descriptive in nature, with both qualitative and quantitative data. 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 study identified several factors, which are the major determinants of the block chain adoption. They were categorized into four domains. Motivational aspect, Internal barriers, External barriers and Ecosystem barriers. Out of this research, it came out clearly that there is need for a framework on block chain adoption, putting into consideration the factors identified as the element of the framework.*

**Keywords:** Block chain, Insurance industry, block chain adoption, determinants, framework.

## 1. Background Information

Blockchain is a technology for a new generation of transactional applications that establishes trust, accountability and transparency while streamlining business processes (Indranil 2016). Think of it as an operating system for interactions. It has the potential to vastly reduce the cost and complexity of getting things done. It's essential for Blockchain technology to be developed following the open source model so a critical mass of organizations will coalesce around it—and reap its full benefits (McKinsey, 2016). Because of the open source rules, participants can trust that the technology will fulfill their needs and conform to industry standards—assuring interoperability between Blockchain applications. Also, by sharing the foundational layer, the participants can focus their individual efforts on industry specific applications, platforms, and hardware systems to support transactions. It's a completely novel architecture for business—a foundation for building a new generation of transactional applications that establish trust and transparency while streamlining business processes. It has the potential to vastly reduce the cost and complexity of getting things done. Essentially, it could help bring to business processes the openness and hyper efficiency we have come to expect in the Internet Era (Indranil 2016). Transactions are grouped together into a block and the chain is multiple blocks, linked together. Blocks are numbered in ascending order, 0 is first/oldest. The number is the 'height' of the block. It only goes from newer to older block, a block only directly links to the one immediately before it.

Once the block is stored, it's readonly, which is why it doesn't link to the ones after it, which would require you to

update it. Blocks are created periodically, by a process called 'mining'. A block represents a set of events that have occurred over a particular time frame, usually, since the previous block. Blocks aren't identified by their height, but by their id. Block id is the 'hash' of the data in the block. A size number specify how much data is coming next. All are transactions. Metadata like version number of the block format, link to previous block that came immediately before it, the root of all the transaction in the block, Time stamp of when the block was created, etc. A block is identified by their id, the hash of the metadata. Blockchains solve specific problems, which databases cannot do yet. They are fully distributed, highly fault tolerant. It does not need centralized authority, providing 3rd party trust without trust, while reducing double spending and very low transaction costs.

In a survey carried out by deloitte in 2019, 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 in 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.

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 insurance 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. 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).

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 clear identification of all the factors which determine not only the uptake, but also the adoption of block chain technology in the insurance transactions, which has the potential of solving most of the problems listed above. This study seeks to identify such factors.

## 3. Research Objectives

### 3.1 General Objective

The general Objective of this study was to identify the key factors which determine adoption of block chain in insurance industry in the Kenyan context.

### 3.2 Specific Objectives

The following were the specific objectives of the study

- 1) To establish the elements of block chain adoption.
- 2) To establish the challenges being encountered in adoption of block chain.
- 3) To establish the barriers in block chain adoption.
- 4) To establish the awareness of benefits of block chain technology in the 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 dis-tributed and reliable platform for customer-controlled personal data, peer-to-peer (P2P) insurances, and smart contracts”*

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

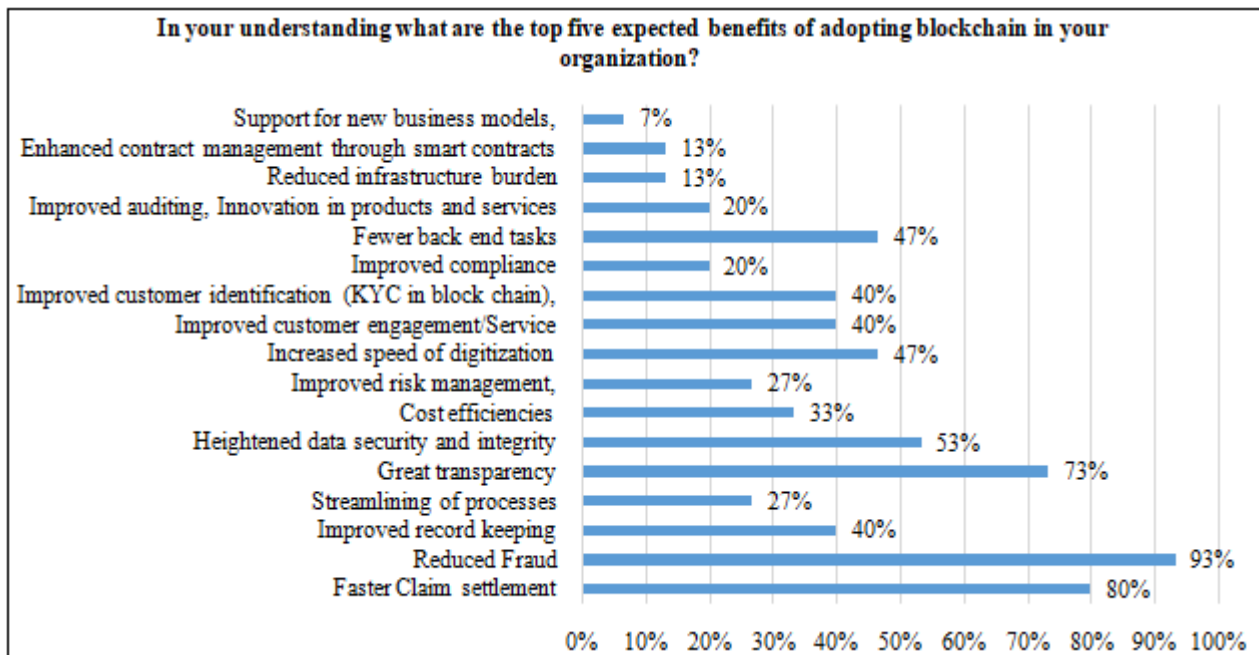
has been several reported use cases of block chain in other industries like banking, supply chain and medicine. This study therefore sought to establish the determinants of block chain adoption in the industry.

**5. 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. Data Analysis**

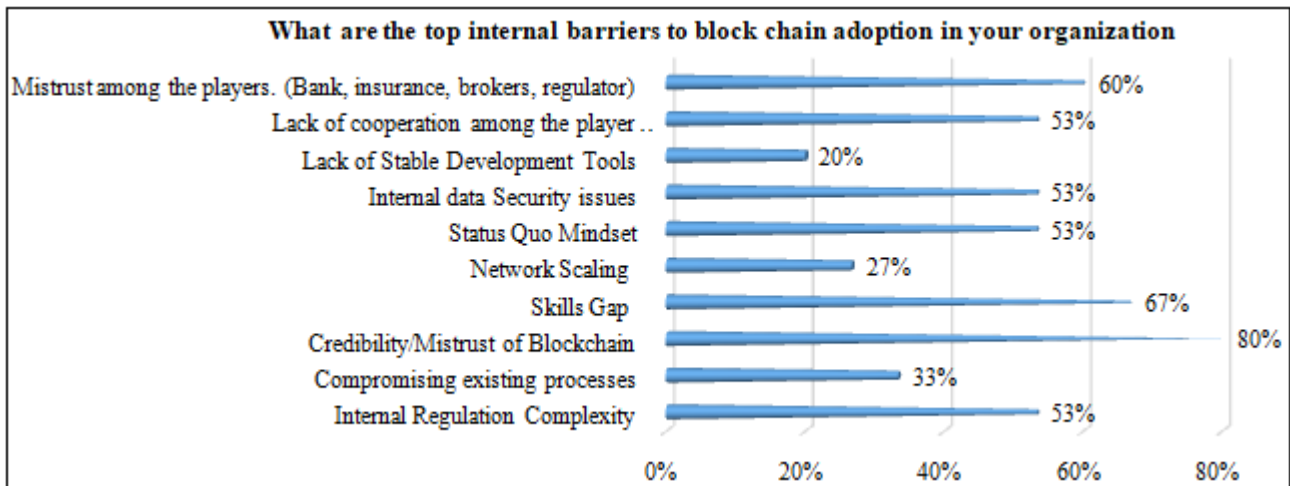


**Top six benefits of adopting block chain in business organizations.**

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%

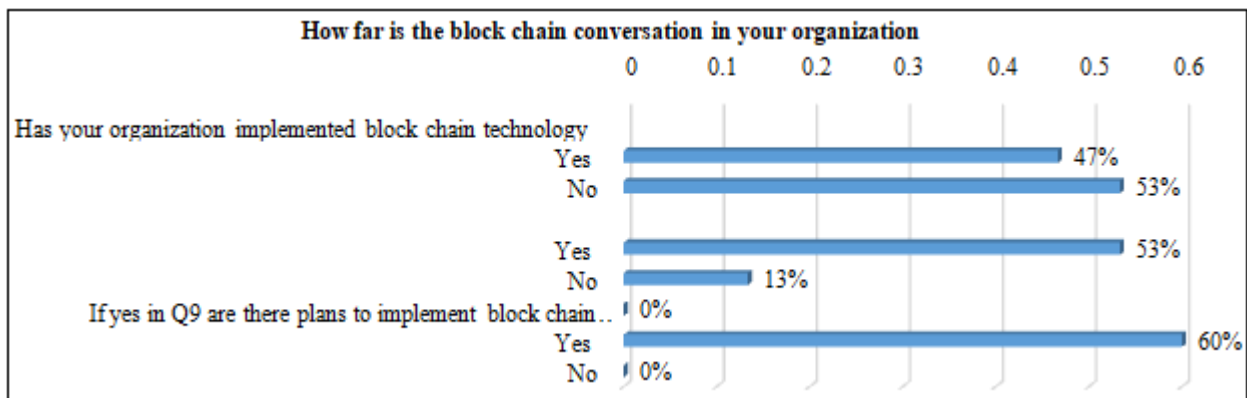
- c) Mistrust among the players 60%
- d) Internal regulation complexity 53%
- e) Status quo mindset 53%
- f) Internal data security issues. 53%
- g) Lack of cooperation among the players 53%



**Top barriers to block 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



Organizations which have implemented block chain technology

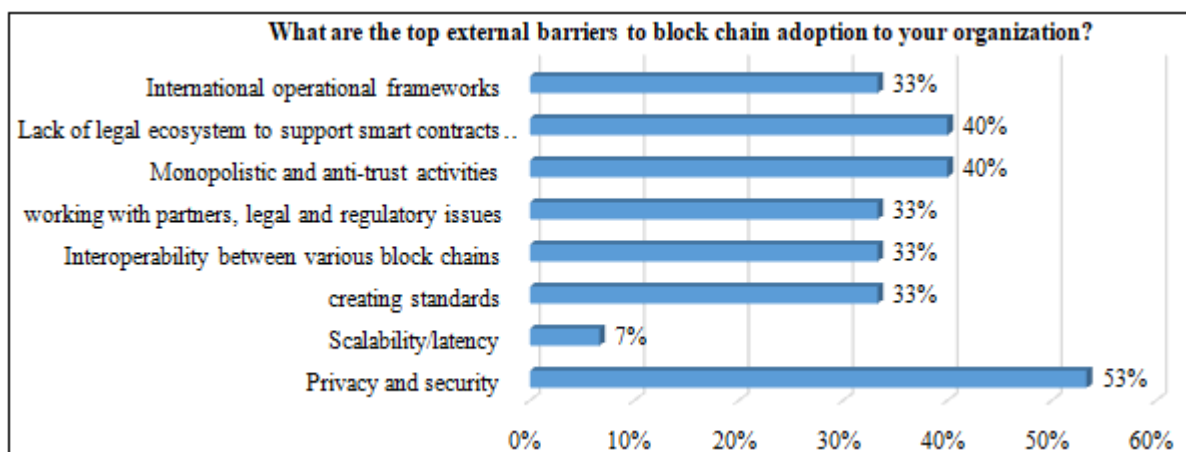
The top three internal barrier to adoption of block chain as per the respondents are;

- 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.



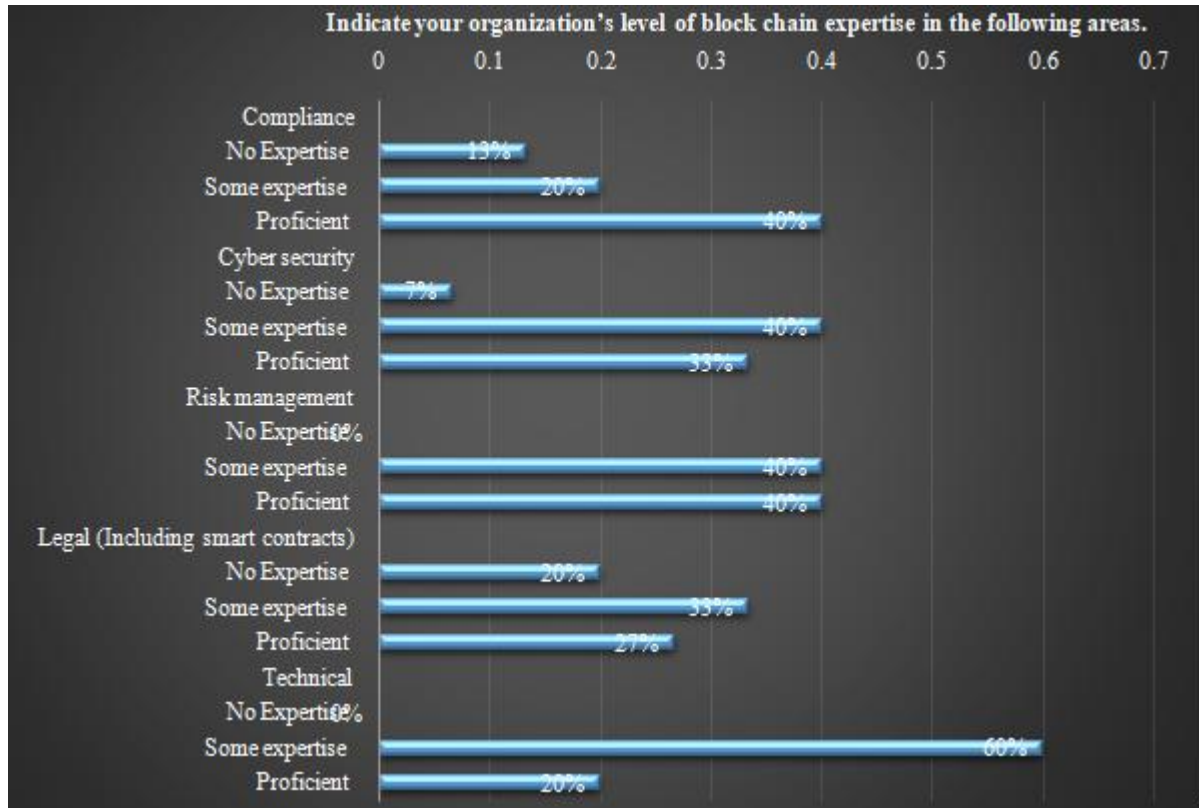
Top external barriers to block chain adoption to insurance organizations.

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

- a) Cyber security

- b) Legal issues

- c) Technical proficiency

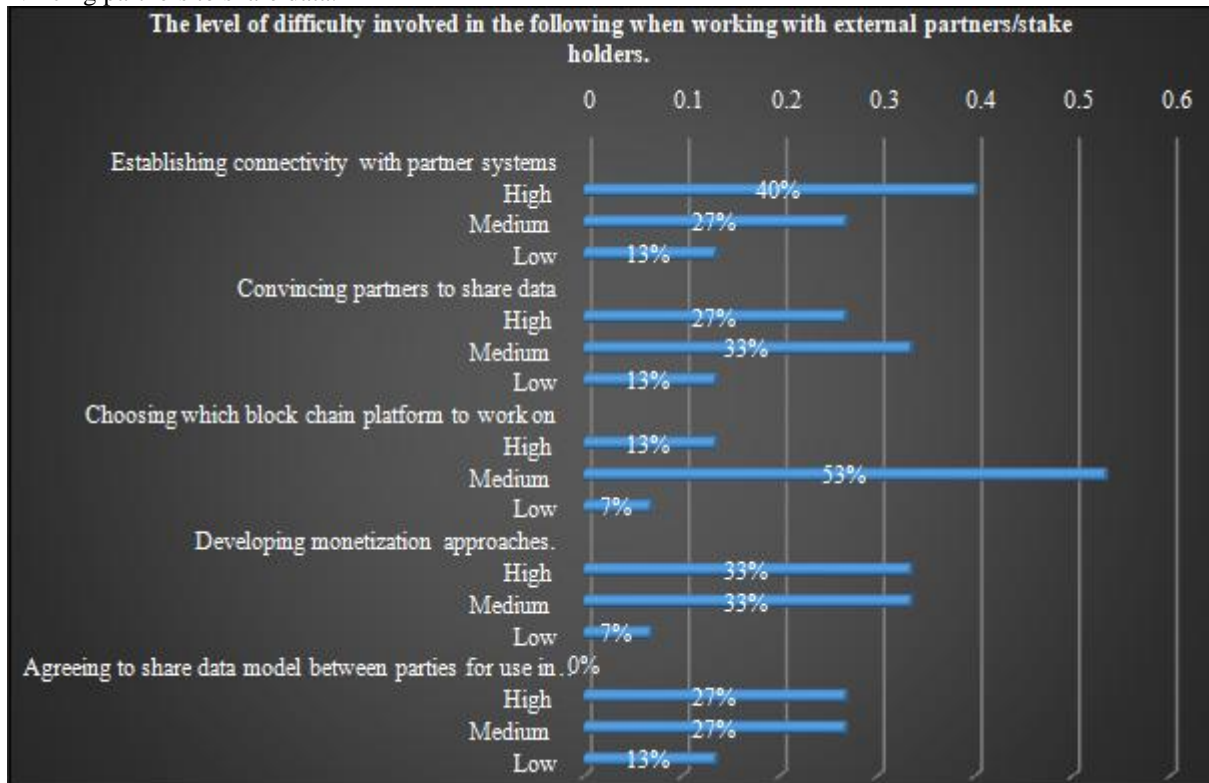


Level of block chain expertise in various areas

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 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. This confirms that in deed block chain has tangible benefits in the industry.

From the study, the following five benefits of using block chain technology were identified as 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. Therefore, there are already perceived and realized benefits for using block chain.

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. This is an indicator of the elements in block chain which need to be addressed for the success of block chain adoption in the industry. The above listed barriers are a part of the determinants of block chain adoption.

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

The determinants were classified into various categories, based on domains. Motivational aspect, identified as Perceived benefits which include; 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. Barriers are elements which need to be addressed for a successful adoption of block chain technology. They include; credibility/mistrust of block chain, skills gap, mistrust among players, internal regulations complexity, status quo mindset, internal data security issues, lack of corporation among players.

Internal barriers to adoption of block chain were identified as; Privacy and security concerns, monopolistic and anti-trust activities and lack of legal ecosystem to support smart contracts.

External barriers to adoption of block chain technology by insurance companies were identified as follows; cyber security, legal issues and technical proficiency.

Ecosystem barriers were also identified as follows; 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.

In conclusion, the above aspects are therefore the determinants of adoption of block chain technology in the insurance industry.

Therefore, there is need for a framework on block chain adoption, which will put into consideration the factors identified in this study as the elements of the framework.

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