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INSURANCE TECHNOLOGIES (INSURTECH): BLOCKCHAİN AND ITS POSSİBLE IMPACT ON TURKİSH INSURANCE SECTOR

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ABSTRACT

Blockchain is a trustless technology which offers the highest level of transparency. Based on trust, the insurance sector and the use of blockchain may seem contradictory. However, leading international insurance companies are already investing in blockchain. It is suggested that the blockchain technology will bring efficiency to insurance processes and allow for better policy pricing and risk management, an improved insurance compensation experience which, in turn, will increase the trust placed on the sector, while ensuring the ability to offer services to an increased number of clients with the development of new insurance products and the use of smart contracts. In order to ensure that blockchain proves beneficial for the insurance sector, several systems and actors available in the sector will need to use blockchain-based insurance practices. Insurance companies will need to take several steps if they are to incorporate blockchain processes to their new business model. Insurance companies need to better understand the blockchain technology and to make necessary adjustments to their systems, and they need to decide which processes are to be incorporated to their business and how to introduce these processes to their clients. This study focused on the application areas of the blockchain technology in the insurance sector, its impact on the sector, the steps insurance companies need to take in order to ensure the widespread use of blockchain-based insurance practices, and it explored a number of current blockchain practices.

Keywords: Blockchain, Insurance, Insurance Sector, Insurance Technologies

Jel Codes*: G22, O30*

SİGORTA TEKNOLOJİLERİ (INSURTECH): BLOCKCHAİN VE TÜRK SİGORTA SEKTÖRÜ ÜZERİNDE OLASI ETKİLERİ

ÖZ

Blockchain, en yüksek düzeyde şeffaflık sunan güvenilir bir teknolojidir. Güvene dayanarak, sigorta sektörü ve blockchain kullanımı çelişkili görünebilir. Ancak, önde gelen uluslararası sigorta şirketleri zaten blockchain'e yatırım yapıyor. Blok zincirleme teknolojisinin sigorta süreçlerine verimlilik kazandıracağı ve daha iyi politika fiyatlandırması ve risk yönetimi sağlamasının yanı sıra, sektöre duyulan güveni artıracak, aynı zamanda hizmet sunabilme kabiliyetini arttıracak geliştirilmiş bir sigorta tazminat deneyimi sunması önerilmektedir. yeni sigorta ürünlerinin geliştirilmesi ve akıllı sözleşmelerin kullanımı ile artan müşteri sayısı. Blockchain'in sigorta sektörü için faydalı olduğunu kanıtlamak için sektörde mevcut olan çeşitli sistemler ve aktörlerin blockchain temelli sigorta uygulamalarını kullanmaları gerekecektir. Sigorta şirketleri yeni iş modellerine blockchain süreçlerini dahil etmek için birkaç adım atmaları gerekecek. Sigorta şirketlerinin blockchain teknolojisini daha iyi anlamaları ve sistemlerinde gerekli düzenlemeleri yapmaları gerekiyor ve işlerine hangi süreçlerin dahil edileceğine ve bu süreçlerin müşterilere nasıl sunulacağına karar vermeleri gerekiyor. Bu çalışmada blok sektörünün sigorta sektöründeki uygulama alanları, sektöre etkisi, blok sigorta temelli sigorta uygulamalarının yaygın kullanımını sağlamak için atılması gereken adımlar sigortaya odaklanmış ve bir dizi akım araştırılmıştır.

Anahtar Kelimeler*: Blockchain, Sigorta, Sigortacılık Sektörü, Sigorta Teknolojisi*

Jel Kodu: *G22, O30*

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INTRODUCTION

In the aftermath of the Industrial Revolution, the world rapidly moved on to the Technological Revolution. End-users welcome the technological innovations made especially in the product and service segment, and technology-related products readily enter global markets and increase their market share in no time. As a result of this development and transformation, finance sector and technology are drawn closer in recent years which resulted in the increased use of financial technology products and related brokering services. In the wake of these developments, Satoshi Nakamoto published a whitepaper in 2008, "Bitcoin: A Peer-to-Peer Electronic Cash System" and it can be said that this article marked a turning point in financial technology (Nakamato, 2008:1). Traded for the first time in 2009, Bitcoin had a strong uptrend until 2017 and became widely recognized. The popularity of Bitcoin was studied by a number of circles and it was concluded that it is just a small output of the Blockchain system. A Blockchain system is defined as a decentralized system which has data transfer capabilities without the need for the intermediary of third parties (Nakamoto, 2008: 1).

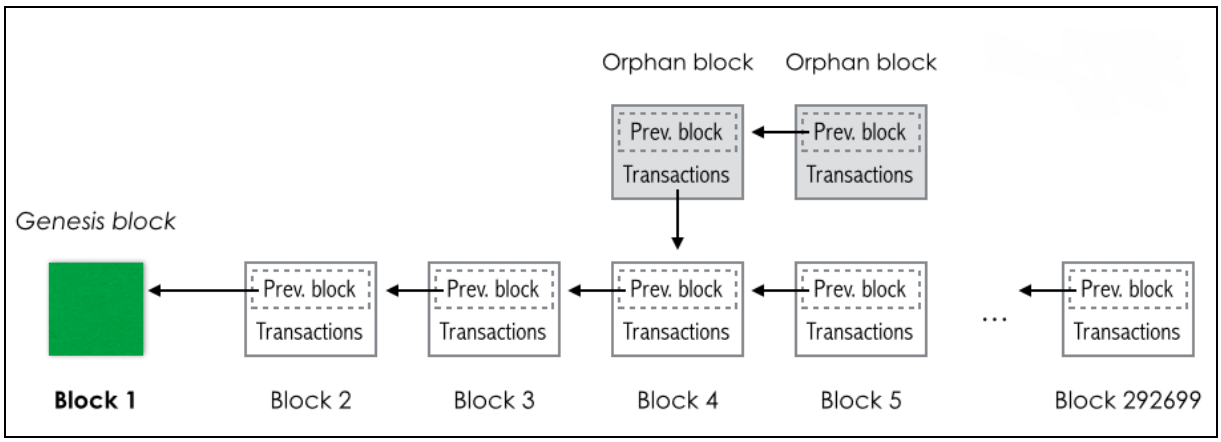
The purpose of insurance, on the other hand, is to offer insurance services to the clients in order to meet their needs fully and to reduce the risks involved in their operations. Insurance companies will need to offer innovative and impeccable services if the sector is to grow and develop. Any innovative entrepreneur who places importance on their business and who knows how to offer the best services to their clients may benefit from the development of the insurance sector and may secure millions or even billions of dollars' worth of growth for their business if they develop a business model using InsurTech (Acer, 2017). The Blockchain technology is expected to transform the insurance sector drastically. A number of innovations such as new insurance models, services to minimize the risks, information technologies to prevent insurance misconducts are now adopted in the insurance sector.

This study analyzes the applicability of the blockchain technology to insurance operations and explores the current status of relevant practices. Nevertheless, we are going to discuss the innovations brought into the insurance sector by the blockchain technology and innovative products aimed at cost reduction.

1. BLOCKCHAİN TECHNOLOGY & THE PROCESSES INVOLVED

Online shopping, online payment and money transfers and banking transactions are now grown dependent on financial institutions, i.e. third parties. In order to reduce/eliminate such dependency, blockchain system which offers a decentralized payment option was suggested by "Satoshi Nakamoto". Nakamoto (2008) explained the blockchain system, a Peer-to-Peer (p2p) system which eliminated the third party involvement. Blockchain system can be defined as a system where digital data can be stored in a distributed manner (open to all users) using communication networks while at the same time ensuring that the data is unaltered throughout this process. Blockchain system acts as a ledger where all the transactions are recorded. The system was born with the founding of the first block (Genesis). The Genesis Block is the first-ever block of Bitcoin mined by Satoshi Nakamoto. Modern versions of Bitcoin number the Genesis Block as block 0 (Usta A. & Doğantekin,2017: 24).

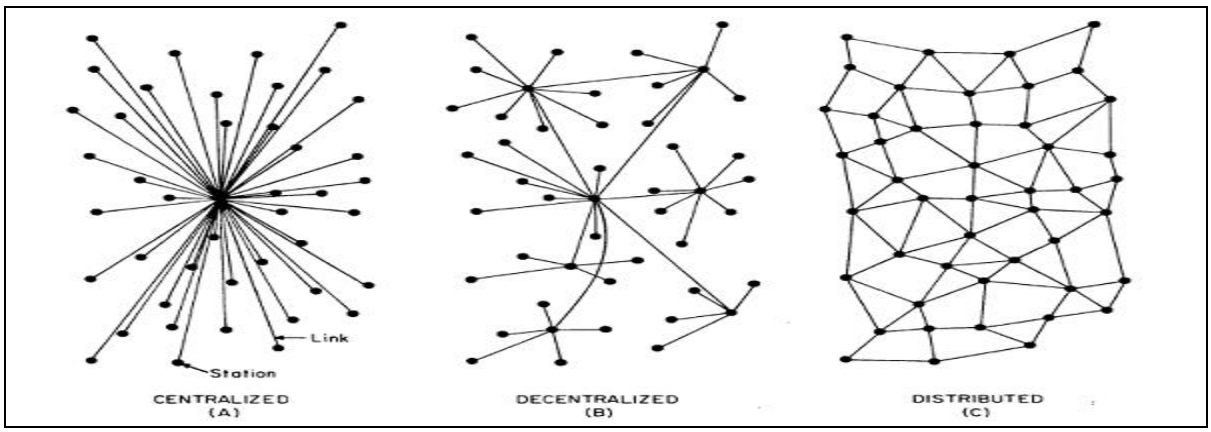
Fig. 1. The First-ever Block of Blockchain System



Source: http://tech.eu.

Blockchain system acts as a ledger where all the transactions are recorded. The system was born with the founding of the first block (Genesis). Genesis Block is the first-ever block of the blockchain system. Modern versions of Bitcoin number the Genesis Block as block 0. Blockchain system theoretically includes an unlimited number of "nodes" (all the end-points in the system). This structure is defined as a distributed network (Vigna and Casey, 2015:150). A distributed network, in general terms, is similar to a ledger. The figure below shows the distributed network structure of the blockchain system.

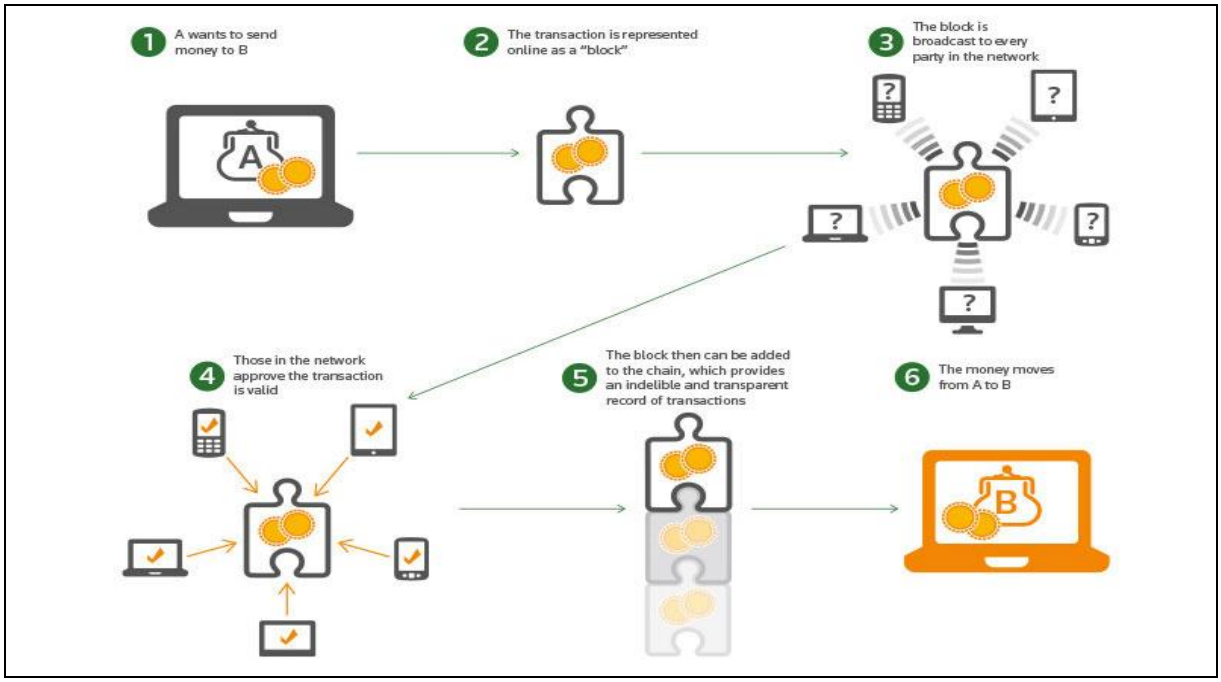
Fig. 2. Distributed Network Structure



Source: https://teknochain.com.

The structure commonly used by modern financial brokering companies involves a network center and a multicenter network. Blockchain system, on the other hand, involves a distributed network and it claims that this distributed network acts as a security function (http://coin-turk.com/). System security is converted to digital format which can be tracked by all the users of the system using data encryption. Below is a money transfer between two peers and the processes involved in this transaction to bring insight about the workings of the blockchain system.

Fig. 3. Money Transfer in Blockchain System



Source: https://blockchain.info/tr.

As shown in Fig. 3, the transaction to be performed between two peers, or the transfer of files or data are recorded to blocks. Cryptographic function of the blocks is enabled during this process. In other words, a hash code is generated for each transaction and this code is written into the blocks. Hash code creates a chain consisting of all the relevant blocks. Hash function is a simple function which generates input. Hash function takes an information, data, etc. and returns an alphanumeric string. Hash code consists of numeric digits (0-9), uppercase letters (A-Z), and lowercase letters (a-z). After data is converted to a hash function, the transaction is performed. The process involved in conversion to hash code can be considered as data resizing. Fig. 3 illustrates the money transfer between persons A and B and the process starts with the A's request to wire money to B (1st step). This transaction is then digitized with the code SHA 256 (2nd step). This digitized data is announced to all the users of the system 3rd step). Miners operating in the system confirm the transfer (4th phase). Upon confirmation, this data cannot be deleted, it is recorded in the blocks (5th step) and the transfer is concluded (6th step).

Thanks to decentralized infrastructure and consensus mechanism in place, the blockchain technology has drawn the attention of several institutions and academy. Indeed, the blockchain technology is now a part of financial services along with the R&D efforts conducted in combination with fields such as supply chain processes, political campaigns, immigration and citizenship processes, healthcare services, etc.

1.1. Insurance Sector from the Perspective of the Blockchain Technology

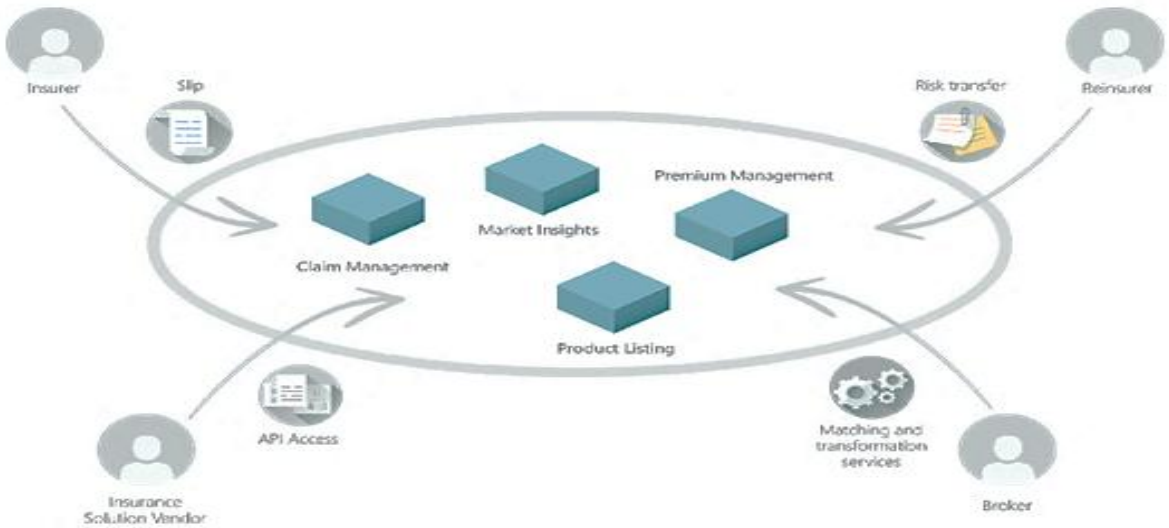
To put in a way Bitcoin miners would understand, insurance is a centralized collection and distribution model where companies made financial commitments to their clients. From the perspective of the blockchain technology, insurance sector is distinguished from others in many aspects (Larimer, 2016), as follows;

1. Cooperation of the Insured
2. Policy pricing based on strict observations of the results and all the data (Actual Costs and Estimated Costs)
3. Investment Risk
4. Privacy
5. Personal Relations
6. Insurance Misconduct
7. Individualized Risk

Today, insurance companies are commonly established in the form of cooperatives or incorporated entities. Many insurance companies operating in the market today once operated under the name of 'charity fund'. Persons and companies transfer any risks involved in their operations to insurance companies in exchange of a specific fee as part of the insurance system. Insurance companies need to use actuaries in order to calculate monthly premium payments and compensation of damages. Actuaries collect statistical data and use this data to define the risk profile of each and every client. Insurance companies are obliged to have large amounts of reserves as decreed in relevant laws. Such reserves can be in the form of investment, otherwise the insured cannot enjoy the benefits of using their money in this way which, in turn, creates opportunity costs. Even when the insurance company prefers to deposit the money to a bank, selecting the option with the minimal risk, such reserve would still be under risk as the bank uses the money to invest in risky credits.

All the insurance companies have to combat insurance fraud. Insurance fraud may take the form of faking illness or a medical condition, false reports of theft, or even crashing one's own automobile due to an expensive and uncovered failure. Insurance companies would employ investigators in order to prevent insurance fraud. Insurance sector has a number of actors such as the insured, insurance companies, reassurance companies, experts, brokers, banks, etc. (see Fig. 4).

Fig. 4: Structure of the Insurance Sector from the Perspective of the Blockchain Technology



Source: https://www.ixledger.com/solutions.

The use of blockchain technology brings convenience to insurance companies in terms of programs and policies, premium payments and insurance claims. Insurance sector demands an intensive information flow.

Among the segments where the blockchain investments are expected to grow in insurance sector are, as follows (KPMG, 2017);

1. Commercial fields and reassurance,
2. Correspondence bots firms use before the claims resolution, decision support systems, and the use of artificial intelligence for virtual assistance,
3. Internet of Insurance with the world becoming more interconnected every other day,
4. Technology supported cyber insurance solutions and services,

It is expected that the blockchain transformation will have an effect on many fields and that not only firms but also technological manpower will turn their attention towards the insurance sector.

1.2. Effects of Blockchain on Insurance Sector and Possible Application Areas

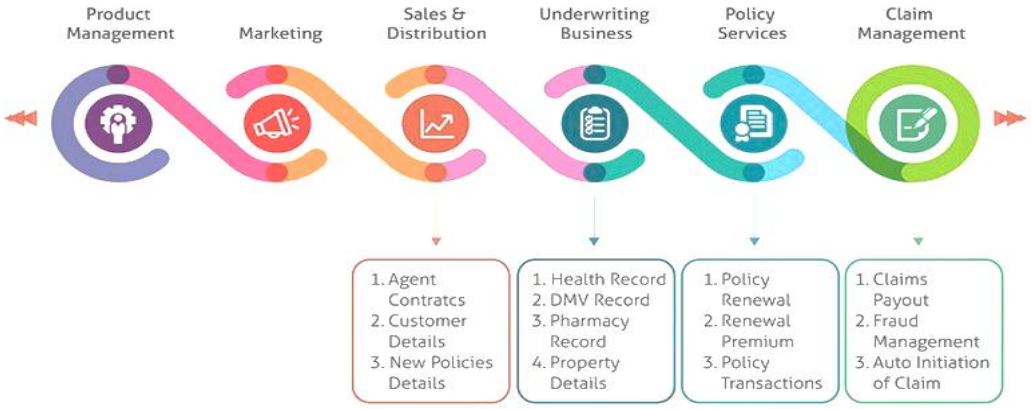
In addition to being preferred by financial technology companies, the blockchain technology is now being used by different sectors and segments. The first choice of many firms for the protection of recorded data, the blockchain technology draws attention of the major actors of the insurance sector. Several authorities suggested that the insurance sector will be one of the sectors to be affected the most by the blockchain technology in the close future.

Among the contributions of the blockchain technology to the insurance sector are, as follows (KPMG,2017);

1) Offers a saving method for insurance companies,
2) More efficient processes,
3) Advanced pricing and risk management,
4) Improved reliability with a better compensation experience,
5) Ability to offer services to increased number of clients,
6) Demand for new insurance products and services,
7) New ‘smart’ contract models.

The blockchain technology, from the perspective of the insurance sector, may offer cost savings between 30% to 60% in the development of new products. These processes involve a number of interactions between the parties (brokers, insurance companies, etc.) such as payment authorization, transaction execution and conflict resolution where they first accept their debts. Complexities and operational challenges arise due to the effort to coordinate the actions of and information communicated between different organizations and systems.

Fig. 5: Applicability of the Blockchain Technology in Insurance



Source:http://umbertocallegari.com.

A blockchain or a distributed ledger may act as a record shared between parties and it may help coordinate and reduce the complexities involved in shared processes. In other words, it may reduce the technology operation costs which, in turn, accelerate the processing time throughout the insurance distribution network. Payment reconciliation and liquidation are performed directly through the agency of the ledger, which means that they can be performed on block-based platforms, i.e. it will not be mandatory to use cryptocurrencies such as Bitcoin and Ethereum. (www.sigortagundem.com)

The development of blockchain applications in insurance depends highly on the effect of the network. In other words, the more the number of systems and users using blockchain-based insurance applications, the faster and greater the impact on the insurance sector.

The possible application areas for blockchain in insurance sector are, as follows (Çipil, 2017):

1. It may be used for its decentralized and trustless transaction structure, for the purpose of improving fraud detection and data management, and to offer cost advantages.

2. It may offer a reliable and cheaper method for sensitive personal information sharing, including medical history.

3. It may offer the basis for Peer-to-Peer insurance products with its reliable and transparent transaction infrastructure.

4. It may ensure the widespread use of micro insurance applications through the Peer-to-Peer structure.

5. Damages management and payment processes may be accelerated and the operational costs involved may be reduced.

Blockchain may be used in fields where the transparency is of utmost importance, as it is the case in insurance sector. Thanks to the structure of the blockchain, all the documents can be readily accessible by all the parties which, in turn, eliminate document fraud. The use of blockchain in insurance and any other field where transparency is needed may ensure fast and trouble-free processes. Damage processing sometimes proves to be an annoying and tedious process. Insurance firms commonly face with false claims, the need for reviewing interrupted data sources or obsolete policies and they often process these documents manually. The human error probability is rather high. Blockchain provides the perfect system for risk-free management and increased transparency. Its encryption capabilities make it possible for the insurance companies to have control over the insured assets.

1.3. Blockchain Compatibility in Insurance Firms

It is highly possible that the blockchain use in the insurance sector will become a win-win model with the participation of all the stakeholders. It may eliminate shared problems such as long process completion times due to multiple layers and dirty data, reconciliation needs, data transfer, and transaction volume. With the smart contract procedure, it has the potential to change the sector fundamentally. The fact that rules can be defined digitally and changed dynamically will bring the insurance companies advanced operational efficiency.

It is without question that the regulatory and supervisory bodies will play an important part in the blockchain transformation. It is of utmost importance that this is an integral element of the business models of these regulatory and supervisory bodies and that they reason with insurance companies. In this transformation, insurance companies will inevitably go through a number of changes.

Among the steps to be taken by the insurance companies with regards to their new business models adapted to the blockchain technology are (http://www.sigortacigazetesi.com.tr):

1. Classification of blockchain as public, private or hybrid; definition of the owner, inclusion of transactions, identification of the advantages brought and how to communicate these advantages to the clients,
2. Creation of the ecosystem and building the right partnerships,
3. Ensuring the support of executive management and building a task force,
4. Anticipate the next steps to be taken in terms of the business model,
5. It is important to test blockchain and similar technologies in small-scale applications and to see how the structure works in practice.

Insurance companies need to better understand the technology and prepare a list of suggestions with this regard if they are to complete the blockchain technology transformation in the insurance sector. Testing the technology in this field stands out as an efficient method to illustrate new business possibilities for the insurance companies just like it was the case in big data, analytics, etc. For this purpose, insurance companies will benefit from cooperation with startups, academic innovation centers, and institutions operating in other fields. Such cooperation offer competitive advantages to the companies in question in formulating the correct value proposition for the client.

1.4. Risks Involved in Blockchain Applications in Insurance Sector

In general terms, blockchain is recognized by people and the institutions as one of the most exciting technology with immense potential. However, it poses a number of risks, weaknesses and challenges in the development phase, as it is the case for all the new technologies. (https://teknochain.com). It is important to know that this technology is yet to be endorsed and that its advantages and disadvantages will become clearer in the next three to five years to come (http://www.sigortagundem.com).

Blockchain leads to significant savings in transaction costs and time required to process such transaction. However, the initial investment may prove to be discouraging. Blockchain technology is a rather new one, and the published blockchain platforms are considered to be "experimental". The fact that it is a new technology makes it vulnerable to software errors and cyberattacks and any bugs found especially in open source blockchain platforms may lead to significant economic loss. Developers are updating these platforms routinely to fix the bugs and to add innovations, but the decentralized and democratic structure of especially the open source blockchain platforms prove problematic due to the challenges involved in ensuring these updates are installed at each node. This, in turn, may lead to forking.

Blockchain can only be used under certain conditions, i.e. it requires multiple peers, and the data used to obtain results must be correct and unalterable. What happens if the number of peers is limited, the data is unreliable and if there is already a reliable tool used?

In such cases, blockchain will prove to be limited with regards to the 3Ss listed below:

1. Scalability due to ever-growing data as a result of continuous duplication and approvals,
2. Security due to development; unforeseen or unmitigated threats,
3. Standardization. As a new technology, blockchain is devoid of standardization and investment decisions.

CONCLUSION

In the close future, blockchain platforms will become the media where digital communication is created and secured. It will be possible for the consortiums of major banking institutions of the world and insurance companies to connect to each other using the blockchain technology. Nevertheless, storage of information and documents in a blockchain will allow for the smart contracts to make legal decisions and to implement such decisions autonomously using these documents. In the insurance sector, decisions will be made autonomously in any field from the policy issuing and underwriting to claims payments. Insurance-specific blockchain technology simplifies the processes such as submission of damage claims, reduction of high premium payments, creation of niche coverage and, most importantly, provision of benefits to those living in disaster areas.

Moreover, it will dramatically change the centralized means of designing insurance tasks and services where trust is created and managed using traditional processes.

Creation of the blockchain ecosystem, and improved cooperation in the sector, especially the cooperation with the academy and institutions operating in other sectors, are among the other steps to be taken. Insurance sector needs to define the application areas for this technology and to change their insurance business models in order to enjoy the full potential of blockchain.

The concern escalated by the insurance companies and other sectors with regards to blockchain is the question of reliability attached to this technology which brings great convenience. Many companies are already making investments in order to better understand the application areas of this technology and to take action in this respect. And it is expected that the concerns about security will be eroded as a result of the efforts made in this field. Moreover, backdoors found in the system make up the greatest problem for the insurance companies at the moment.

The future of insurance may flourish if the blockchain technology is intelligently adopted with cryptocurrencies, anti-fraud solutions and smart contracts. Large insurance companies can see a great potential in using this technology. But such adoption means that insurance companies will need to change their insurance processes, policy structure, and their risk loads. Blockchain allows for the development of cheaper and more customer-oriented products by large insurance companies.

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