

# BLOCKCHAIN IN INSURANCE INDUSTRY: TURNING THREAT INTO INNOVATIVE OPPORTUNITIES

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## ***ABSTRACT***

*Insurance has been around for more than centuries. This risk mitigation strategy has been utilized in maritime commerce as early thousand years ago, where Asian merchant seafarers were pooling together their wares in collective funds to pay for damages of individual's capsized ship. In 2018, insurance industry made up 6% of global GDP while financial industry amounted to about 7-9% of the US GDP. In 2020, the industry net premiums written totaled \$1.28 trillion, created 2.9 million jobs, and recorded \$2.0 trillion investments. Despite of growing reform, the insurance market is dominated by intermediaries assisting people to match their insurance needs. While many predictions focused on artificial intelligence, cloud computing, blockchain stands out as the most disruptive technology that can change the driving forces underlying the global economy. We will focus on presenting blockchain use cases in insurance, demonstrating how the sector can turn blockchain threat into innovative opportunities.*

## ***KEYWORDS***

*Blockchain, insurance, risk management, innovation.*

## **1. INTRODUCTION**

Blockchain in recent years becomes one of the largest and most popular technology in the academic sector and financial industry. Even though blockchain appears to be new and speedily evolving technology, it has the potentiality to digitally transform processes inside and outside organizations and influences coordination as a mechanism to rule companies. Financial sector in many instances rely on blockchain to find durable solutions to some of the common problems faced in the insurance industry including decreasing operational cost and false claims, increasing efficiency and service delivery through technological innovations, and growing the customer base through trust. The paper aims to provide a clear-eyed view of how blockchain can be used in the insurance industry for process innovation. Throughout this paper, we focus on business use cases showing where the technology can bring efficiencies which enables the sector to turn the disruptive power of blockchain into opportunities.

## **2. LITERATURE REVIEW**

### **2.1. Blockchain – How it Works**

Blockchain technology is a publicly verifiable, shared, immutable distributed ledger used for recording the history of transactions. This is a chain of blocks that contains information inside a

block, and each block is associated with a hash of its previous and subsequent blocks to create a chain. It consists of nodes where each node maintains its local copy of the chain and relates to peer-to-peer (P2P) connections. Blockchain is a combination of three existing technologies which are digital signature, cryptographic hash, and distributed consensus mechanisms. It is the basic infrastructure, or the underlying digital foundation that supports applications such as Bitcoin, Ethereum, Litecoin, etc. This emerging technology enhances the process of storing transactions and tracing assets in a cooperate network.

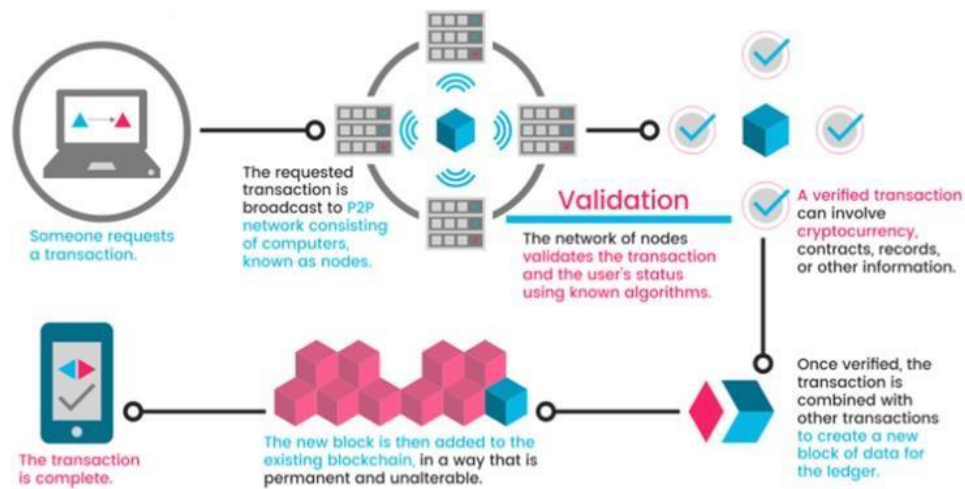


Figure 1. How blockchain technology works

## 2.2. Smart Contract

A conventional contract is an agreement between two or more parties that is enforceable by law; a smart contract is an agreement between two or more parties that lives on a blockchain and is enforceable by code. Permissioned blockchain are more suitable for data protection regulation compliance its abilities to restrict participants involved in the consensus mechanism on its network.

## 2.3. Immutability

In a blockchain network, once a transaction is fully processed, it cannot be altered. No falsification could be made because each transaction is unique and recorded solely in the digital ledger.

## 2.4. Distributed

All transactions can be seen on a distributed database; they can be validated by every partaking node contingent on the uniform rules (Martino, 2016). Cryptography and consensus algorithms are fundamentally utilized to validate transactions, update the ledger, keep the network and the ledger secure.

## 2.5. Distributed Ledger

In accounting, a ledger is simply a book or computer file that records transactions. Today, most of computing services that we utilize run on centralized networks, in which a central server stores and distributes data to other computers on the network called clients. In contrast, blockchain systems run on peer-to-peer (P2P) networks in which all nodes have equal status and concurrently operate as both client and server to one another. Every node participates in the consensus process saves a copy in real time of the ledger, which is why blockchain is referred to as a “single source of truth”.

## 2.6. Auditability

In the distributed ledger, every transaction is "validated and recorded with a timestamp", this enables users to verify and trace the previous records through accessing any node in the distributed network. It improves the traceability and the transparency of the data stored in the blockchain.

## 2.7. Trust

Once a transaction has been completed in a blockchain network, the immutability of blockchain makes it nearly impossible to make changes, which increases confidence in data integrity and reduces opportunities for fraud.

## 3. CHALLENGES

Insurance industry encounters numerous challenges, and they keep growing over the time to become more consistent and complex. More recently, many insurance experts turn their attention to the potential of blockchain to address long-standing challenges related to the industry future and blockchain technology adoption. There are plenty of obstacles identified, but global regulations, trust and lack of accounting standards are eminent challenges for the world facing blockchain adoption [8].

### 3.1. Insurance industry challenges

Nowadays, when it comes to support, it's not a secret for anyone in service industries that customer needs and expectations are increasing and getting higher than ever before. High customer expectations lead to new challenges and create needs for new standards of services by insurance companies. The central finding of this document is that blockchain solutions have the potential to increase efficiency and improve outcomes, that can force the sector to find out ways to address the following challenges: (1) Insurance organizations and reinsurers retaining fragmented records about insureds, assets, providers, and policyholders on various systems simultaneously, and the will of implementing blockchain based innovation is not an easy decision to pursue. (2) Insurance applications and systems lacking to provide robust security measures to secure participants information. (3) Lack of visibility when information is sharing between insurers, peers, providers, claimants. (4) Carriers collecting and assembling pertinent information and documents from multiple sources. (5) Multiple handoffs between systems contributors increasing time, cost, and risk of fraud. Currently, it is very challenging for a Certified Public Accountant

(CPA) to assess management's accounting policies for digital assets and liabilities, which are presently not directly addressed in global financial reporting standards or in U.S. generally

accepted accounting principles. A financial audit involves an assessment that recorded transactions are supported by evidence that is relevant, reliable, objective, accurate, and verifiable. The nature of a transaction recorded in blockchain system may or may not provide proper audit evidence.

### **3.2. Challenges for Blockchain Adoption**

Like every technology, there are upsides and downsides, blockchain technology comes with multiple form of challenges for its mass adoption. One of the major concerns in this adoption is in terms of security. Scalability of blockchain technology constitutes another major challenge for its adoption and implementation; transactions in blockchain system are validated through consensus mechanisms, the continuous replication, and the immutability of this technology lead to ever-growing amount of stored data. Industry professionals still want to see how well blockchain solution can perform in terms of integration with legacy systems to reduce total cost of its implementation. Other obstacle that needs to take into consideration is the lack of legal and regulatory framework since organizations have complex business rules and regulatory obligation to comply with.

### **3.3. Trust in Digital Economy**

The key denominator of any economic or financial exchange is TRUST. Digital economy is an economy based on electronic goods and services and created by an electronic business model. Today behind each transaction that is taking place requires the intervention of a trusted third party, even to claim ownership of an asset we rely on government or central authorities to verify and confirm our property rights [6]. Since last decade, we have noticed a phenomenon called “Erosion of Trust” which is expressed as: distrust of central authority, the desire for freedom, the desire for privacy and anonymity, the distrust of intermediaries, and the distrust of corporations. In addition to this new phenomenon, there are various reasons why we may feel not comfortable to rely on third parties to provide these operations. First, and most obvious, are the fees that intermediaries charge for their services, which can be quite high. Third parties sometimes bring inefficiencies. Relying on third party also implies cybersecurity risks, as retaining sensitive data on centralized servers creates a single point of failure for bad actors. Finally, public confidence in financial establishments significantly deteriorated during the global financial crisis, and it may be more than mere coincidence that the Bitcoin protocol, which attempted to provide an alternative to the traditional financial system, was introduced in October 2008, as the global financial crisis was taking hold.

## **4. INSURANCE INDUSTRY AND THE DRIVERS**

In recent years, many factors are shaping the future of the insurance market. Emerging technologies such as blockchain and artificial intelligence (AI), consumer expectations have become predominant drivers that have inflamed the competitive environment. According to Gartner.com, “by 2023 35% of enterprise blockchain applications will integrate with decentralized applications and services” [7]. The adoption of distributed ledger technologies by Payment networks along with decentralized finance (DeFi) applications are among of key drivers of the blockchain technology. The biggest concern remains the ability of blockchain implementation to eliminate the middlemen like brokers and agents sooner or later from the business process model of the insurance industry.

#### **4.1. Emerging Technologies**

The evolution of emerging technologies such as blockchain, artificial intelligence (AI), and machine learning offer a great opportunity for the current insurance system into a type of digital insurance platform.

This approach will lead to create new value, and new concept like “InsurTech” that stands for Insurance and Technology which is an insurance version of FinTech. The objective is to leverage technology power to increase productivity and efficiency in the insurance industry. To have an idea of how this technology could impact the global economy, on October 13th, 2020, London-UK, a report produced by PwC states Blockchain technology has the potential to boost global gross domestic product (GDP) by US\$1.76 trillion over the next decade [5].

#### **4.2. Customer Expectations**

Based on various studies, customer expectations are highest that it has never been before. Insured, claimants, and other participants expect personalized and fast service at their finger. This new and ongoing trend of social and technology are shaking in many ways the regular business patterns in the sector. Insurance agencies need to ensure customers their information remains private and have adequate measures in place to secure while sharing data with other entities. Prospects like options” and they are generally looking for advises and recommendations from the industry’s Professionals. By establishing a consistent communication with their customers and assisting them with the shopping process, are the effective ways for insurers to elevate customer service experiences.

#### **4.3. Innovation and Disruption**

Innovation and disruption are frequently walk hand-to-hand, throughout this paper, these terms have more connection how the insurance industry is now developing and will continue to advance into future. Conventional insurance agencies and reinsurers are utilizing emerging technology to bring certain efficiencies into the industry which could potentially lead to higher financial gain or a more favorable competitive edge. It may also result in a competitive drawback due to their long-established business models and their high-value investments in infrastructure. Any variation to the current business model could be greatly challenging for some agencies since a new business model may necessitate a reduction of the sales of the insurer’s existing business. Despite of those pain points, new start-up companies can take these opportunities to build a unique or different business model designed to exploit weaknesses in old-fashioned insurance’s operations [9]. This advantage is not a guarantee for new start-up to survive in the marketplace. Other factors such as time, workforce mindset, customer satisfaction, and user acceptance play a role to their success or failure.

#### **4.4. Key Players**

Among Fintech initiatives, there are two major players capturing our attention:

B3i - Launched in 2016, Blockchain Insurance Industry Initiative (<https://b3i.tech/>) which is an international industry blockchain technology consortium that is owned by 21 major insurers and involves more than 40 companies as shareholders, customers, and community members, its main purpose is to improve successes in data exchange among insurance and reinsurance enterprises [2].

The Institutes RiskStream Collaborative (<https://web.theinstitutes.org/riskstream-collaborative>) is the risk management and insurance industry's largest enterprise-level blockchain consortium that connects experts and developers to advance insurance specific use cases. Founded in 2017 and located in Malvern, State of Pennsylvania (USA), The Institutes RiskStream Collaborative states its vision is to advance blockchain technologies and its capabilities to streamlining and bringing efficiencies in all areas of the risk management and insurance industries.

## **5. BLOCKCHAIN IN INSURANCE: USE CASES**

Insurance entails a risk transfer mechanism that involves a financial institution(insurer) taking a potential risk from a customer in form of a loss or damage caused by events beyond the control of the customer (insured party) and in return the insured agrees to pay a fee called premium. The following use cases address improvements in insurance market operational functions as well as dealings with providers, intermediaries, claimants, insured and policyholders, thereby improving the customer experience, enhancing product value, and laying the groundwork for greater consumer choice in the financial industry. Blockchain technology can be implemented throughout the insurance sector and across many lines of business including:

1. Know-Your-Customer and Anti-Money Laundering (KYC-AML)
2. Loss adjustment / Claim management (Property and Casualty insurance)

### **5.1. Know-Your-Customer and Anti-Money Laundering (KYC-AML)**

Know-Your-Customer is one of the benefits of the blockchain technology which providing a secure digital infrastructure for verifying identity. Insurance companies, reinsurers, and brokers frequently conduct auditing activities to know their customers, it is proactive approach on preventing money laundering usually participates multiple entities like individuals and legal personnel [4]. In May 2017, Singapore government along with several financial institutions have launched a successful KYC project leveraging blockchain technology to provide a registry for customer due diligence and verifying a valid identity in order to reduce money laundering activities. The following use case shows how blockchain can help to reshape outdated KYC processes by allowing for the effective outsourcing and decentralizing of personal data, while also enabling the owner of the data to maintain full control over their data. Blockchain solution will establish a tamper-proof repository using mutual distributed ledger technology which allows several parties to add, certify and exchange KYC and AML documentation. By doing so, customer's data can be securely shared between organizations, providers, and customers.

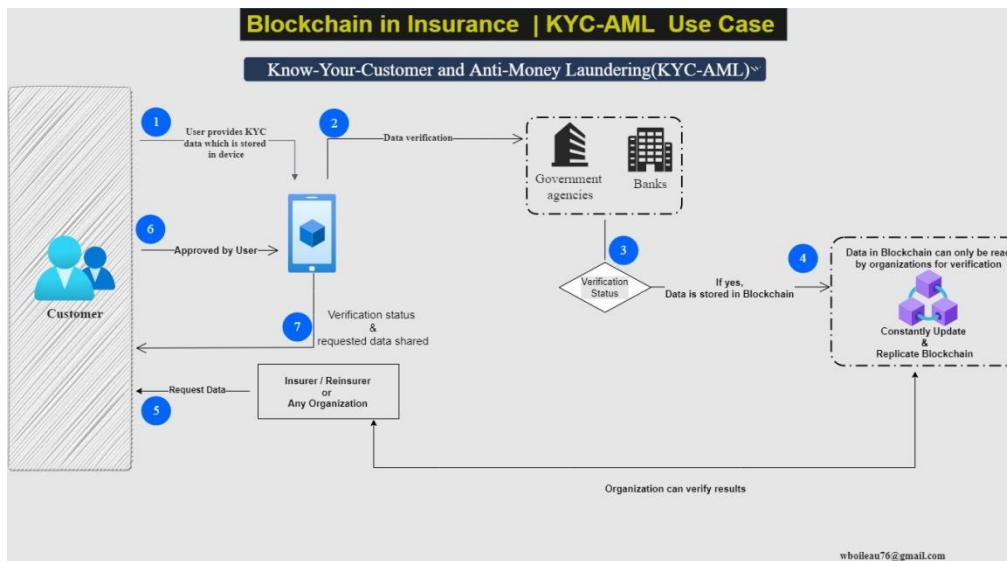


Figure 2. Know Your Customer – Anti-Money Laundering use case

## 5.2. Loss Adjustment/Claim Management

Majorly, there are two types of insurance product: life insurance and general insurance. We encounter two main categories of life insurance – permanent and term [3]. General insurance in other hand deals more with other form insurance related to valuables including home, car, goods, and other hazard like fire. It is divided into 6 major segments namely Motor insurance, Health insurance, Combined, Comprehensive and Package policies, Property insurance, Pecuniary insurance, and Casualty insurance.

Our use case is focusing on property and casualty insurance also known as P&C insurance. Property insurance and casualty insurance are types of coverage that help protect you and your property while Casualty insurance provides liability coverage to protect if you're found legally responsible for an accident that causes injuries to another individual or damage to another entity's belongings. One of the big challenges with insurers is collecting the proper data to assess and process claims. Most insurance systems are an errorprone process using excessive human involvement in terms of manual data entry, paper works and coordination between different parties. Blockchain technology can be utilized to automate claim applications and processing. In the event a natural disaster is confirmed by the mandated state institution with the magnitude and level of impact, a smart contract can be triggered to make payments to the affected communities.

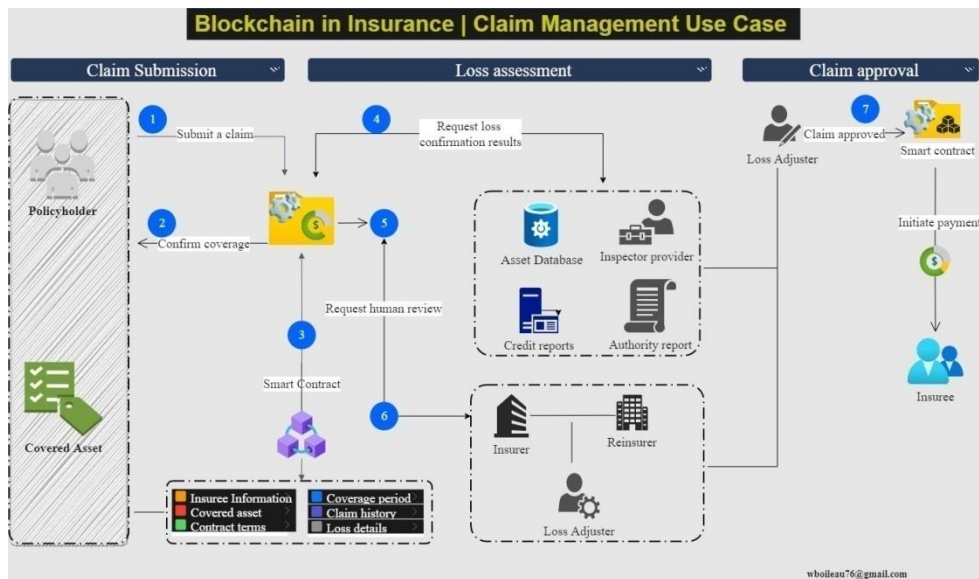


Figure 3. Claim management use case

## 6. CONCLUSIONS

As has been noted, in section 3, we provide challenges for the insurance industry based on blockchain technology, section 5 explains how blockchain can bring value and enable innovation in the value chain of the industry invariably giving rise to a new business model. As has been demonstrated, insurance industry can leverage blockchain technology to enrich crucial processes like claim submission and processing, antimoney laundering, fraud detection and prevention. Firstly, while blockchain technology is making its baby steps, there are several promising use cases and applications for it in the insurance industry. We have already seen areas blockchain can lower operational cost and automate redundant process. Secondly, from the industry perspective, we discovered there is a great need for insurance companies to align around standards and processes within blockchain. While blockchain technology is developing better tools and framework for this market to collaborating and sharing data, insurance agencies themselves and other entities part of this eco-system like regulators, financial institutions, and government entities must be willing to work with each other. The technology must go further in terms of development to address privacy, security specially about public blockchain where everyone has access to each transaction in the ledger. Finally, since the insurance is highly regulated sector, legislators need to play their partition by providing legal and regulatory frameworks for Insurtech, in addition laws and procedures currently in place, there is an urgent need to expand and furnish a clear guidance for blockchain technology to succeed.

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