

# **Blockchain technology: the application and influence on China's insurance industry**

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**ABSTRACT :** *In recent years, with the rapid development of China's insurance industry, there are also some bottlenecks such as security, information asymmetry, low-efficiency of information management and so on. And the application of blockchain technology can help to break through the bottlenecks with the characteristics of distributed data storage, point-to-point transmission, consensus mechanism and encryption algorithm. This paper illustrates the current state of play and the existing problems of insurance industry, and offers an approach to alleviate or even solve the above pain points with regard to Blockchain applications, while introduces and prospects the applications of Blockchain within China's insurance industry.*

**KEYWORDS** -Blockchain, Insurance, Information Asymmetry, Information Island

## **I. Introduction**

The development environment of China's insurance industry is bright in recent years. However, with the rapid development of economy, the insurance industry is also facing many problems. Such as security, information asymmetry, low-efficiency of information management and so on. The characteristics of Blockchain such as information backup, security and non-tampering can fundamentally solve many problems in the insurance industry. Insurance companies such as PICC, Sunshine insurance group and Zhong'an online insurance company took the lead in trying to combine blockchain technology with insurance related business, launching innovative insurance products and making innovations in insurance underwriting and claims settlement. Those applications revealed that the addition of Blockchain can alleviate or even solve the development dilemma of insurance industry.

## **II. Research background**

Opinions on accelerating the development of modern insurance service industry (hereinafter referred to as the "Ten new rules") of the State Council was officially promulgated on August 10, 2014. The "Ten new rules" takes the development of insurance industry as a strategic task, points out its future development direction, and plays an important role in promoting the further development of China's insurance industry. It is stated in BFA (Boao Forum for Asia) in April 2018 that China's financial industry will be further opened to the outside world, and half of the specific measures announced have focused on the insurance industry<sup>[1]</sup>. By the end of 2016, there were 155 insurance companies in China with more than 10 million employees. In 2017, the original insurance premium income of the insurance industry was 3658.101 billion yuan, and the life insurance business was the most eye-catching, accounting for 58.7%. However, with the rapid development of economy, the insurance industry is also facing many problems.

The emergence of blockchain technology has brought changes to the insurance industry and even the entire financial industry. Since 2015, governments and industries around the world have realized that blockchain technology has broad application prospects in banking, securities, insurance, internet, public services, notarization, auditing and other fields. The application and service of blockchain technology in the insurance industry can enable the insurance industry to realize "overtaking on the curve", which can not only provide convenient and efficient security services for insurance users, but also promote the rise of the whole insurance industry.

## **III. Several problems in China's Insurance Industry**

### **3.1 Security**

Insurance company's electronic policy information is mostly stored in the computer, but the computer has the risk of being occupied and tampered with. The security of the Internet has always been one of the biggest difficulties in the insurance industry. The figure shows the global expenditure on information security of the insurance industry was as high as US \$81.6 billion in 2017, an increase of 8.1% over 2016.

### **3.2 Fraud and insurance fraud caused by information asymmetry**

In China, customers and insurance companies do not trust each other completely. Because of the complexity and variety of claims terms of insurance companies' products, insurance sales sometimes even do not fully understand the relevant regulations, which is a problem in the development of China's insurance industry. Information asymmetry in the insurance industry may lead to fraud and insurance fraud. It is predicted

that 5% - 10% of insurance claims are fraud. The cost of these insurance frauds exceeds \$40 billion a year, according to the FBI. In addition, information asymmetry may also lead to adverse selection and moral hazard.<sup>[2]</sup>

### 3.3 Low-efficiency of information management

After decades of development of insurance informatization, the business system within the Department has formed a relatively independent operation system, causing several "information island", which is a closed chain with low efficiency, complex and slow process. Due to the huge business data of insurance companies, the efficiency of the insurance industry is difficult to be significantly improved. A lot of human and material resources are invested to manage information data with the unavoidable disadvantages of high error rate and high cost, which greatly hinders the development of the insurance industry.

## **IV. Blockchain technology helps insurance industry break through development bottlenecks**

The characteristics of blockchain such as information backup, security and non-tampering can fundamentally solve many problems in the insurance industry. The famous insurance companies in the world, such as AXA France and ASSICURAZIONI GENERALI, have gradually realized the importance of blockchain technology in insurance and began to invest heavily in the application of it, which fully shows that blockchain technology has played a role in promoting the development of the insurance industry. It helps to break through the development bottlenecks of the insurance industry, makes full use of electronic information technology and regulatory conditions, and highlights the advantages of the insurance industry in application.

### **4.1 Improve security**

Blockchain technology can improve the security of the insurance industry<sup>[3]</sup>. First, blockchain technology encrypts and protects the information of insurance business according to the computer encryption algorithm. At present, the main application technologies of blockchain in encryption protection include mixed currency, ring signature, homomorphic encryption and zero knowledge verification. Second, blockchain technology can effectively protect information from being modified. The unique technology of blockchain marks the anti-counterfeiting function, and each chain has a protective effect on the authenticity of information. If you want to modify the information, you need to modify all or most of the information, which is not only complex, but also takes time and effort. It is invalid if you modify a small part of the information on the blockchain because the rest of the chain can still verify the real information and data, which shows that the information on the blockchain can not be tampered with at will, and has the protection and self-healing ability to the business data and information. Third, the distributed storage mode of blockchain technology ensures data consistency. Distributed storage is to store the information in each node, and every piece of information has a relative backup, which ensures that even if individual information is tampered or omitted or deleted due to negligence, the insurance information and data of customers will not be lost, and the correct information can be found in other nodes of the database.

### **4.2 Reduce information asymmetry**

Blockchain technology can help the insurance industry reduce the problem of information asymmetry. It makes insurance terms easy to manage by processing information. Its ledger function and decentralized digital inventory can record information timely and effectively, and independently verify the real situation of customers and policy information, which enables insurance companies to find out whether the current situation is true or whether the traders are suspicious when the compensation occurs. The information of electronic insurance policy stored in Blockchain is separated from the policyholders and insurance companies, which can solve the information island problem of insurance business. The relevant records of the policyholders can not only help the insurance company to identify whether the applicant has the behavior of fraud, but also help to improve the efficiency of the insurance business. For example, KEY ID and GXChain have been committed to collecting customers' relevant information such as educational background information, shopping information, payment information, etc in addition to the previously collected identity information, which can depict the characters and extract the characters' characteristics, making it more quickly for insurance companies to find out whether the policyholder has cheated and more smoothly to the claim settlement work. Real information data is an important means of anti fraud and cost reduction. At present, major insurance companies invest tens of billions of dollars to obtain real information data every year in order to avoid insurance fraud.

### **4.3 Improve the efficiency of information management**

Blockchain technology can greatly improve the efficiency of insurance work on the basis of smart contract. Smart contract was proposed by Cryptologist Nick Szabo, referring to a technology that can automatically execute the contract when certain conditions are established in a computer database. The use of smart contract greatly improves the information security. Through the smart contract based on Blockchain, standard customer information is collected in the early stage of insurance sale and entered into the smart system. If there is a claim or other situations triggering claim, the smart contract will make compensation according to the conditions set up in advance, thus omitting too many complicated steps, which greatly improves the efficiency of traditional insurance compensation and saves the labor cost for insurance companies. For example,

if the harvest of some agricultural products is not good due to weather or natural disasters, compensation shall be made automatically to the insured farmers by the smart contract of blockchain technology through the weather information. Although the application of blockchain technology in the smart contract can not completely replace the labor, its performance in the current work has greatly saved the labor cost and information management cost.

#### **4.4 Anti fraud and insurance fraud**

Insurance industry is very complex with intensive financial knowledge, so many insurers and customers are prone to fraud and insurance fraud. Blockchain can solve this problem from many aspects. First, eliminate duplicate insurance, or use the same insurance accident for multiple claims<sup>[4]</sup>. Second, establish ownership mechanism through digital certificate to avoid identity forgery. Third, reduce the situation of insurance brokers selling insurance policies privately to collecting premiums, so as to reduce the loss of premium income of insurance companies<sup>[5]</sup>. Fourth, Blockchain can keep permanent records for the insurer and the insured, and the proven fraud will exist for a long time and play a warning role.

Blockchain technology plays an important role in the financial industry, and also has a significant impact on the insurance industry. Blockchain technology not only changes the traditional way of data management, but also adjusts the privacy and security of information. Although blockchain technology is still in the growth stage and it is still some time before it is widely used in the insurance industry, it has helped the insurance industry break through many bottlenecks. With the development of blockchain technology, the application prospect of it in the insurance industry will be brighter.

### **V. Applications of blockchain technology in China's Insurance Industry**

PICC is one of the first insurance companies in China to focus on blockchain technology, and released the world's first white paper on insurance blockchain research in April 2017. In addition, insurance companies such as Sunshine insurance group and Zhong'an online insurance company also took the lead in trying to combine blockchain technology with insurance related business, launching innovative insurance products such as "Fei Chang Hui" and "one account chain", and making some innovations in insurance underwriting and claims settlement.

In terms of application, "one account chain" has been put into use in blacklist sharing, supply chain finance, one account of financial institutions, small and micro enterprise loan platform, asset platform and other scenarios. In the application of reinsurance blockchain, the platform connects the two parties of reinsurance transaction to the blockchain, which makes the policy data can not be tampered with, and ensures that there is real traceable data when the premium is generated in the future. Through the authorized encryption and decryption scheme and the smart contract of FiMAX, the privacy protection of the policy data and smart matching of insurance policy are realized. The data after transaction is directly stored in the chain for bookkeeping, avoiding the errors in the reconciliation of the direct insurance company and the reinsurance company.

In 2017, Zhong'an Insurance launched the "Bubuji project" of joint blockchain technology. This is the first time that the blockchain technology has been applied to the poultry industry (chicken industry). Due to the privacy, security and non-tamper of the blockchain technology for information storage, its application can enable the information of feeding and processing is true and reliable during the period from the chicks grow up to adult chicken, and can also trace the information. Through the combination of blockchain technology and insurance companies, the information management of insurance companies and chicken farms can be shared, so as to reduce the error rate of insurance companies' information, and make the insurance company control the risk more accurately and efficiently.

In the same year, Shanghai Insurance Exchange successfully verified the transaction information of blockchain technology. This verification was witnessed by several insurance institutions, which verified whether Blockchain can be applied to insurance credit investigation from the aspects of function, performance, security, operation possibility, etc. In the verification process, the operation speed of blockchain technology has reached 300tps, which can not only meet the requirements of commercial insurance for system speed and performance, but also solve the problems related to insurance company's credit investigation more efficiently according to the security, privacy and non-modifiable functions of blockchain technology.

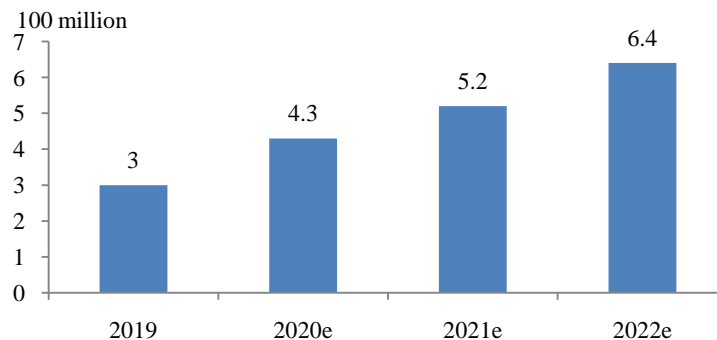


Figure 1. Block chain investment of China's insurance institutions

According to Ai Rui's statistical model (as shown in Figure 1), the investment of block chain in 2019 is Rmb300 million, and the forecast in 2020-2022 is Rmb430 million, 520 million and 640 million respectively in China.

## VI. Conclusion

At present, blockchain technology is still in the stage of continuous development, facing many problems<sup>[6]</sup>, such as energy consumption, network technology security, market operation standardization and so on. However, with the development of the times, the combination of blockchain technology and the financial industry will be closer and closer, and blockchain technology will also bring more development opportunities for the insurance industry.

To sum up, although the blockchain technology is not fully mature, its features of decentralization, traceability and non-tampering have been preliminarily applied in the modern financial field, which has become the focus of business academic industry in the new era. The financial industry has changed from the traditional human creation management to the integrated management of network technology and information. In this wave of financial technology, China is actively exploring and innovating, combining new technologies such as blockchain technology with traditional industries. Just like the combination of blockchain technology and insurance industry, the addition of Blockchain can alleviate or even solve the development dilemma of insurance industry<sup>[7]</sup>. But at present, the application of blockchain technology in China's insurance industry is not in-depth and common, lack of practical large-scale application, and the profit and loss is difficult to predict<sup>[8]</sup>. The future development direction of insurance business is mainly to promote smart contract technology, which will be inseparable from the participation and practice of the whole industry and the active promotion of cross industry.

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