



InsurTech: Infrastructure for *New Insurance*



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Introduction



Five years ago, ZhongAn Insurance was established as the first online-only insurance company in China. Since then, the insurance industry has undergone tremendous changes as a result of the introduction of technological innovations in the industry, also known as insurtech. Online insurance has become the key highlight of the financial inclusion movement, and insurtech has become the new frontier for cutting-edge financial applications and value providers.

- Insurtech has triggered innovations throughout the insurance industry. As part of the rapid development of online insurance, our industry has made great strides in insurance inclusion, efficiency improvement, experience optimisation, product innovation, and other areas. Insurtech is becoming the major growth driver for industrial innovation. As a result of insurtech, new applications in various business processes—from pricing and underwriting to distribution and claims—have flourished, and the innovative capabilities of the industry have reached new heights.
- Insurtech has accelerated the upgrading and transformation of the insurance industry. Using technological applications from various industries, the insurance industry has blazed a new trail in technology-driven development. Technologies like big data, cloud computing, and artificial intelligence have redefined the technological service standards of the insurance industry; and more importantly, these technologies have supported the upgrading and transformation of the fundamental infrastructure of the industry. They have enriched the protection provided by insurance coverage, while reinforcing its core risk management capability and steering the insurance industry as a whole toward high-tech, intelligent, and modernised development.
- Insurtech has forged a brand-new ecological model in the industry. These new technologies have empowered the traditional insurance industry while also driving the development of a new insurance industry ecosystem. With the support of cutting-edge technology, the insurance industry has reached out across industries and moved towards a more open, pan-insurance ecosystem. This new ecological model focuses on risk management services and has insurance institutions at its centre.

In the new economy era, people are happy to see the surprises brought about by technology, and each surprise generates new expectations. For the last couple of years, insurtech has been broadly promoted and applied. For now, as we step into the intermediate stage of insurtech, insurance and technology will integrate even more closely. Based on the constant evolution and application of new technological innovations, we believe that the insurance industry in China will continue to upgrade and new systematic solutions will continue to emerge, bringing new growth. As the Chinese saying goes, “A single flower does not make spring, but hundreds of blossoms can tell you that spring is coming.” We are very thankful to be in this new era, and to cooperate with all the first-class players in this new insurance ecosystem. Together—through the development of insurtech—we will construct a more efficient, compatible, balanced, and humanised insurance industry, and together, forge a new model of insurtech in China. ”

—Mr. Jin Chen, CEO of ZhongAn Insurance



New technologies such as big data, cloud computing, artificial intelligence, the Internet of Things and blockchain are continuously emerging. They have made the insurance industry more effective and far-reaching, and they have also unleashed an all-around reform of the industry.

1. Insurtech is reshaping the operational ecology of the insurance industry. Insurtech has been embedded into the entire insurance industry value chain—from products, markets and distribution channels to pricing, underwriting, claims and other areas. Ultimately, it will allow for the construction of a new comprehensive system and operational ecosystem for *new insurance*.
2. Insurtech is helping the insurance industry address its weaknesses. Insurtech will push forward the construction of the entire industry's infrastructure, improve insurance companies' risk management, and strengthen regulators' capabilities and supervisory tools. Insurtech will also allow for industry participants to share industry infrastructure.
3. Insurtech is driving the high-quality development of the insurance industry. Insurtech will help facilitate scenario-based insurance, product customisation, service optimisation, targeted underwriting, and instant claims settlement. In short, it will address all the areas that were previously the subject of public complaints and allow for high-quality development of the industry.
4. Insurtech will help make insurance available to all. Insurtech can improve efficiency and lower costs. In the future, these technologies will allow diversified and high-frequency insurance products and services to be offered at lower prices. Ultimately, insurtech will make financial services more inclusive.

In this new era, insurance industry development will be centred on finance, with technology providing comprehensive support. As a key building block of the industry infrastructure of the future, insurtech will help the insurance industry better achieve its goals, and will ultimately enable *new insurance* to better serve the public and help people live happier lives. ”

——Walkman Lee, Head of Insurance, KPMG China

Insurtech will continue to optimise the insurance industry by improving insurance products, enhancing service compatibility and lowering regulatory costs. In these ways, Insurtech will construct a rich and resourceful "new insurance" ecosystem.

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Overview

In recent years, China's insurance market has grown rapidly. In 2017, total primary premiums in China hit RMB 3.1 trillion, making China the second largest insurance market in the world. Online insurance has achieved even faster growth than the industry in general. Over the last 5 years, total online insurance premiums in China have increased by nearly twenty-fold, from RMB 11.07 billion in 2013 to RMB 183.53 billion in 2017. The development of online insurance has expanded the insurance industry as a whole. Moreover, as a result of China's vast market and supported by numerous application scenarios, the technology that services online insurance has steadily matured and has become a key driver of growth in the industry. In these ways, insurtech in China has been developing rapidly and will soon rise to the forefront of the global insurance market.

As China's economy transitions into the New Normal, new economic growth drivers, new and expanding demands, and new technologies will result in changes in the insurance industry. In this new technological era, insurtech, which originated from online insurance, is absorbing innovative technologies and promoting applications that reinforce the insurance industry ecosystem. In this way, insurtech has stimulated the construction of a more efficient, compatible, balanced and humanised *new insurance* system, and has become an important part of the infrastructure underlying this system. In this context, China is not only becoming a country with a strong insurance industry—hopefully it will soon become a world leader in insurtech.

Although several new technologies have already been put into practice in the insurance industry, it is still necessary to systematically examine how the various new technologies relate to the insurance industry, and

specifically how they relate to *new insurance*. Important questions include the following:

- What challenges can be overcome with the help of insurtech?
- What role does insurtech play in the *new insurance* system?
- How can technologies be used to promote the development and maturity of *new insurance* and better help insurance industry develop healthily and positively?

With regard to the above questions, we surveyed professionals in both the insurance and technology industries regarding the development status and prospects of insurtech. Our research focused on major domestic life, non-life insurance, reinsurance companies, online insurance companies, insurance intermediaries, third-party Internet platforms, as well as consulting firms, academic research institutions, and other entities. Interviewees included senior executives and employees in various positions in the areas of products, underwriting and claims, actuarial science, risk control, sales, customer service, information technology, data management and more.

By explaining insurtech and its impact more comprehensively, we hope to help relevant industry participants have a clearer understanding of insurtech's development. With such an understanding, participants can more effectively deploy innovative technologies to achieve self-reform, and jointly promote the healthy, steady and rapid development of the insurance industry.

01

Facing the Future: Changes and Challenges in the Industry

In terms of total premiums, China is one of the largest insurance markets in the world. On the other hand, in terms of insurance penetration and insurance density, one might say that China is the most attractive market in the world, with large demands for insurance waiting to be met. The foundation that previously supported the development of the insurance industry has changed. China has been deeply influenced by this latest round of new technologies and has been at the forefront globally in terms of their popularisation. The rise of the younger generation will bring new customer groups to the insurance industry. As always, challenges come with opportunities. To win in the future, the insurance industry must face internal and external challenges directly.

Changes and Challenges in the Insurance Industry



Inside

Accessibility

- Traditional channels
- Internet channels
- Limitations
- Inclusion

Credibility

- Insurance education
- Sales disputes
- Claims disputes

Business Model

- Customer needs
- Channel management
- Profitability

Tech Integration

- Industrial trends
- Practices



Outside

Market Environment

- Economic environment
- Competition inside the industry

Tech Environment

- Technological revolution
- Technological risks

Customer Demand

- Altered needs
- Service experience
- Customer behavior preferences



1. Internal:

► Insurance accessibility needs to be improved

- **Traditional channels have achieved economies of scale, and online channels have grown rapidly.**

Presently, traditional distribution channels still occupy the largest share of the market, where they have achieved significant economies of scale. In the life insurance sector, agents and bancassurance have accumulated over 90 percent of premium income. Nevertheless, online insurance has made rapid progress in recent years. In 2017, 131 insurance companies were conducting online operations, and total online premiums reached RMB 183.5 billion. This total resulted from multiple business lines, including life insurance, annuities, health insurance, accident insurance, auto insurance, liability insurance, credit insurance, property insurance and others. Compared with traditional channels, online channels are characterised by more scenarios, more customer interaction, and stronger buying initiatives. However, the value per customer transaction is relatively low.

- **Existing technological applications need to be further improved to better assist customers in obtaining insurance products.**

Developments in the Internet and other related information technologies have greatly improved consumers' access to information. However, the Internet channel is still relatively weak in terms of its display of complex insurance products. The online availability of complex products needs to be further improved. This situation stems from the fact that complex products are generally priced higher. Also, current technology has not been able to significantly improve customers' perception of complex products and the availability of such products. Finally, customers' awareness of the Internet channel and their trust in it need to be further developed.

- **The value of the insurance industry in the area of inclusive finance needs to be further improved.**

The value of the insurance industry in the field of inclusive finance has not yet been fully realised. This is mainly due to the fact that the customers who are in need of inclusive financial products are more difficult to reach and acquire. Additionally, the risks associated with different customer groups is complicated; risk control measures are limited, and management costs are higher. In the current environment especially, insurance has a low level of satisfaction in special groups such as small and micro-enterprises, urban low-income consumers, the poor, the disabled and the elderly. On the whole, the insurance industry still has significant room for improvement in terms of boosting the transformation and upgrading of economic development and improving social equity.

► Public acceptance of insurance needs to be improved

- **Public awareness with regard to insurance needs to be further strengthened.**

Since reform and opening up began over 40 years ago, China's economy has made remarkable achievements, but the overall financial literacy of the public still lags far behind that of developed countries. Especially in the field of insurance, since insurance products are highly specialised and relatively complex, the public finds them more difficult to fully understand. At the same time, publicity and education programmes are still relatively inadequate, and the majority of the public does not possess comprehensive knowledge regarding risk and insurance.

- **The handling of insurance sales disputes needs further improvement.**

In addition to insufficient public awareness of insurance products, misleading sales tactics and unsatisfactory claims service are also important factors undermining the image of the insurance industry in the minds of the public. According to a circular from the former CIRC on insurance consumer complaints, the number of complaints related to life insurance sales reached 21,329 in 2017, accounting for 46 percent of the total number of life insurance complaints. These complaints mainly reflected the exaggeration of insurance liability or benefits, concealment of coverage period, payment period, withdrawal losses, false publicity and other issues.

- **The quality of insurance claims services needs to be further improved.**

For instance, auto insurance accounts for nearly 80 percent of property insurance premiums. According to a circular from the former CIRC regarding insurance consumer complaints, there were 32,044 complaints related to motor vehicle claims in 2017, accounting for 69 percent of all property insurance complaints. These disputes were mainly related to compensation amounts, liability determination, untimely claims settlement and other issues.



► Difficulties facing the traditional business model

- **Products are homogeneous and do not sufficiently meet consumer demands.**

At present, there is a wide variety of insurance products in the market. However, product development in general does not fully consider market and consumer needs, and does not satisfy different customer groups' demand for differentiated products. Also, products are quite homogeneous. In the future, the insurance industry should focus more closely on customer needs, provide differentiated products and services, expand insurance coverage, further enrich the insurance service experience, and enable the risk protection function of insurance to reach its full potential.

- **Insurance companies' ability to control cooperative channels is weak, and customer acquisition costs are relatively high.**

Currently, insurance companies still rely on traditional channels to sell products. However, insurance companies, especially small and medium-sized companies, have relatively weak control over cooperative channels, including agents and third-parties such as banks, brokers, third-party online platforms, etc. This has led to high customer acquisition costs and increased compliance risks. To achieve sound and sustainable industry development, insurance companies urgently need to explore new ways to cooperate with other channels and acquire new customers.

- **Profitability in underwriting is relatively low, and long-term development is limited.**

In addition to the high cost of obtaining consumers, the overall level of automation and intelligence in insurance companies' operations is rather low, and management costs are high. Also, the loss ratio in some business lines is relatively high or volatile. All of these factors affect insurance companies' underwriting profitability. When it comes to property insurance for example, most large and medium-sized insurance companies' combined ratios are basically around 100 percent, and this ratio usually exceeds 100 percent in small and medium-sized companies. The overall profitability of underwriting in the industry is low, which constrains long-term industry development.

► Insurance technology brings new opportunities

- **Insurance technology provides many future development and application possibilities.**

Insurance technology, which developed from the Internet insurance system, has been driving innovation and development throughout the entire insurance industry. Going forward, technologies such as cloud computing, big data, artificial intelligence, the Internet of Things and blockchain will continue to mature. New applications of these technologies will lead to greater improvements in insurance companies' operations—in areas such as product development, cost control, risk management, customer service and others.

- **Significant infrastructure needs to be built to support the expansion of the insurance ecosystem.**

With the popularisation and application of new science and technology, more demand for insurance is gradually being met. Insurance technology is an important foundation for the insurance industry in the future. Using insurtech, insurance companies will be able to continuously innovate, meet the insurance needs of various groups, build more comprehensive risk management systems, include more subjects in their coverage, and create a more diversified insurance ecosystem. They will also be able to better serve as a stabiliser and connector of economic environment.



2. External:

► **The economic environment is complex and volatile, and market competition is intensifying**

- **The complex economic environment at home and abroad is increasing uncertainty.**

At present, the international economy is picking up, and economic conditions are generally improving. However, there are still uncertainties. Deep-rooted structural issues have not yet been fully resolved. Trade protectionism is increasing; geopolitical conflicts are emerging frequently, and the foundation of economic growth is shaky. At the same time, the domestic economy is currently shifting from high-speed growth to high-quality development. Supply-side structural reform is being steadily implemented, and significant steps have been taken in terms of economic transformation. However, the potential risks cannot be ignored. The complex economic environment at home and abroad has increased overall uncertainty in the market, and has also brought about risks and challenges to the development of the insurance industry.

- **Various entities are flocking to the insurance market, leading to fierce competition.**

There are currently more than 200 insurance companies in China, most of which are small and medium-sized companies. Competition within the industry has been very intense. At the same time, within the traditional financial industry, the insurance sector features different levels of competition in banking, funds and other areas. In recent years, Internet giants with huge user traffic and cutting-edge technology have also been entering the insurance industry and increasing market competition. The emergence of quasi-insurance products such as mutual insurance and

crowdfunding have also had an impact on the insurance market. With the support of insurance technology, more participants have swarmed into the insurance market, which has increased the prosperity of the entire insurance ecosystem while also escalating market competition.

► **Technology drives industrial innovation, bringing opportunities and challenges**

- **The new technological revolution has swept the world, introducing new opportunities for the development of the insurance industry.**

The current technological revolution is being driven by new technologies such as cloud computing, big data, artificial intelligence, the Internet of Things, and blockchain, and it is sweeping the entire world. At the centre of this technological revolution is deeper integration of networks, information and intelligence; transformation of production methods from mass production to large-scale customisation; a shift in value creation from manufacturing to services; and the gradual replacement of programmed labor with intelligent equipment. The technology-driven upgrading of industries has changed the global economic landscape and has created more business models and market opportunities. Specifically, these changes have resulted in more market demand and development opportunities for the insurance industry. The insurance industry is particularly well-suited for digital technology; and for that reason, the new technological revolution will lead to significant expansion of and improvements to the insurance value chain.

- **Attention must be paid to the risks brought about by new technologies.**

The in-depth application of innovative technologies in the insurance industry has led to corresponding technical risks and has resulted in some latent risks that are specific to the industry and its

unique characteristics. For example, in the areas of cloud computing and big data, traditional customer information security problems will be even more prominent. Once information is leaked, the impact will be more extensive, and the consequences will be more difficult to address. In another example, in the future when autonomous driving has been implemented, the risks brought about by equipment hijacking and remote control will present challenges to the insurance industry as well. Risks and challenges like these require the insurance industry to more actively invest in technology and preparation measures in order to improve the safety of their operations.

► Consumption upgrading is reshaping the market, and demand for insurance is increasing quickly

- **At present, China's economy is in the transformation phase, in which it is shifting from high-speed growth to high-quality growth; and consumption is playing an increasingly important role in driving the economy.**

This combination of growth transformation and consumption upgrading has resulted in an increased demand for insurance. As consumption is being upgraded, the market demand for insurance is shifting from standalone protection to a comprehensive demand for integrated services that cover healthcare, pensions, wealth management and other needs. Especially with the growing middle class and further wealth accumulation, the market demand for services related to risk protection, healthcare and wealth management will start increasing at a faster pace. Additionally, as the Chinese public continues to age, demand for commercial pension insurance will also grow rapidly.

- **Technological development supports different consumption scenarios, and the demand for innovative insurance products is becoming more diverse.**

As technology is upgraded, innovative consumption scenarios are constantly emerging, resulting in a diverse array of insurance products. Examples include return shipping insurance, which was introduced in the e-commerce sector, as well as a variety of scenario-based insurance products in the O2O field. In the future, the continuous development of technology-supported business models will increase the demand for more innovative insurance products and expand the insurance market.

- **The combination of consumption upgrading and technological advances is stimulating new consumer preferences.**

As a result of the application of various innovative technologies, service capabilities in various industries have been steadily improving, which has in turn stimulated consumer demand for better services. Similarly, consumption upgrading is also resulting in customers developing higher and higher requirements for service quality. In this context, when purchasing an insurance product, the customer will not only focus on the product itself but will also pay close attention to the service experience. Research shows that insurance customers in the Internet era pay more attention to product transparency and service experience, while demonstrating a strong preference for personalisation, customisation, mobilisation and scenario-orientation.

02

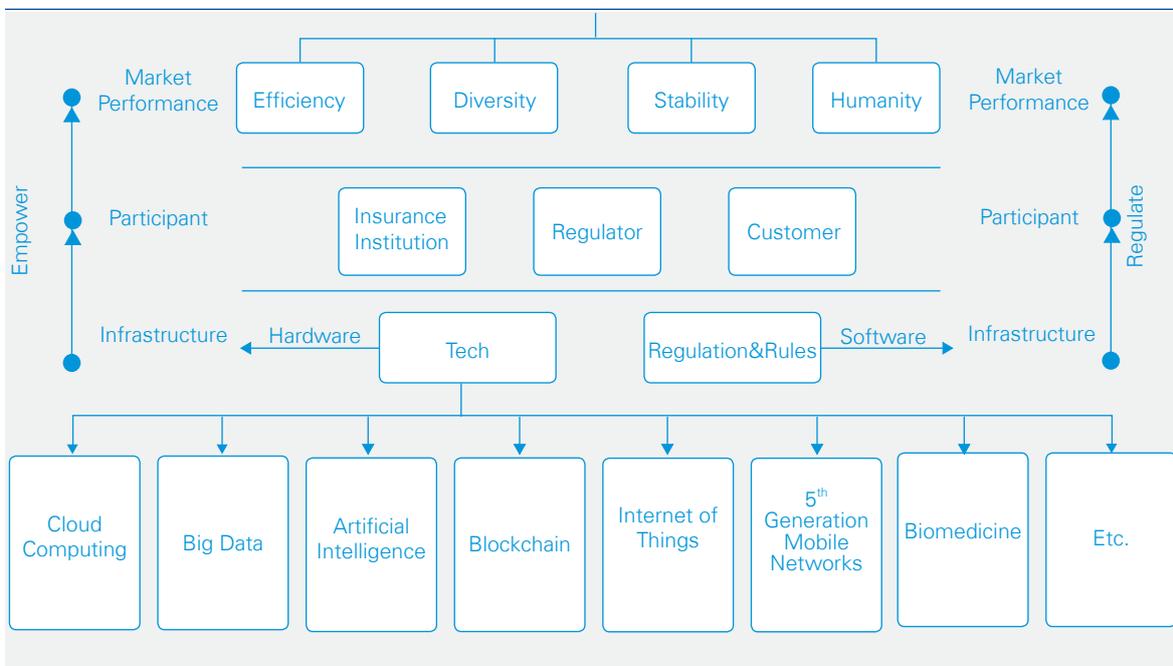
New Insurance: The Value and Mission of Insurtech

In the face of new opportunities and challenges, *new insurance* will create an extraordinary new system.

Factors including macroeconomic development, consumption upgrading, population aging, and technological innovation have presented the insurance industry with new opportunities. At the same time, there are many challenges and uncertainties in the industry—both internally and externally. In this era of change and reform, the insurance industry needs to keep pace with the times and accelerate its transformation. It also needs to reshape the industry’s ecological value chain, and insurtech will be a vital part of this effort.



New Insurance



► Building the necessary infrastructure for *new insurance*

Mastering core technology will be critical to shaping the new insurance value chain. Technologies such as cloud computing, big data, artificial intelligence, blockchain and the

Internet of Things will serve as the technological foundation for the insurance industry as it develops new production methods. In the past, we focused on the effectiveness of insurtech application at the micro-level. Meanwhile, at the macro-level, in order to maintain healthy and high-speed development of the industry, it is more important to have a sound infrastructure as a foundation. China's recent economic development demonstrated a similar theme in that the construction of modern transportation infrastructure, telecommunication networks and other measures were an important step in promoting overall economic growth.

The *new insurance* system, which will be built in the context of the new technological revolution, will leverage its foundational infrastructure to maximise the advantages offered by insurtech. As the "hardware," technology will provide for the systematic construction of the industry. This technological infrastructure will ensure the efficient and stable operation of upper-level applications. Ultimately, technology will help the insurance industry better perform its protective function, better serve the real economy and national strategies, and better fill its role as an economic and social stabiliser. At the same time, at the infrastructural level, insurance technology can also support industrial and regulatory software in order to promote the development of regulatory technology, enhance proactive supervision and regulation, and maintain the systematic stability of the insurance market and the financial market.

► Empowering the insurance industry to modernise and upgrade

To build a *new insurance* ecosystem that is more efficient, compatible, balanced, and humanised, both insurance institutions and regulators need to be more capable of responding to ever-changing consumer needs and rapidly evolving market patterns. As a vital part of the future development of the insurance industry, insurtech can effectively empower market participants and regulators by facilitating the construction of a strong supporting foundation for the industry, so that participants and regulators can work closely together to optimise the market and improve the industry's capacities. In this way, both industrial development needs and market regulation needs can be met.

Going forward, insurtech will continue to support the insurance industry as it undergoes changes and meets new challenges, and will ultimately help the industry create the *new insurance* of the future.

► Building a global insurtech force

In this new era, technological innovation is not only driving China's economic transformation—it also lights the way for global economic development. In recent years, as a result of its innovation-themed development strategy, China has risen to a prominent position in many economic fields, and has been shifting application-driven innovation to technology-driven innovation. China's advanced innovation model has gradually been accepted and recognised by developed countries.

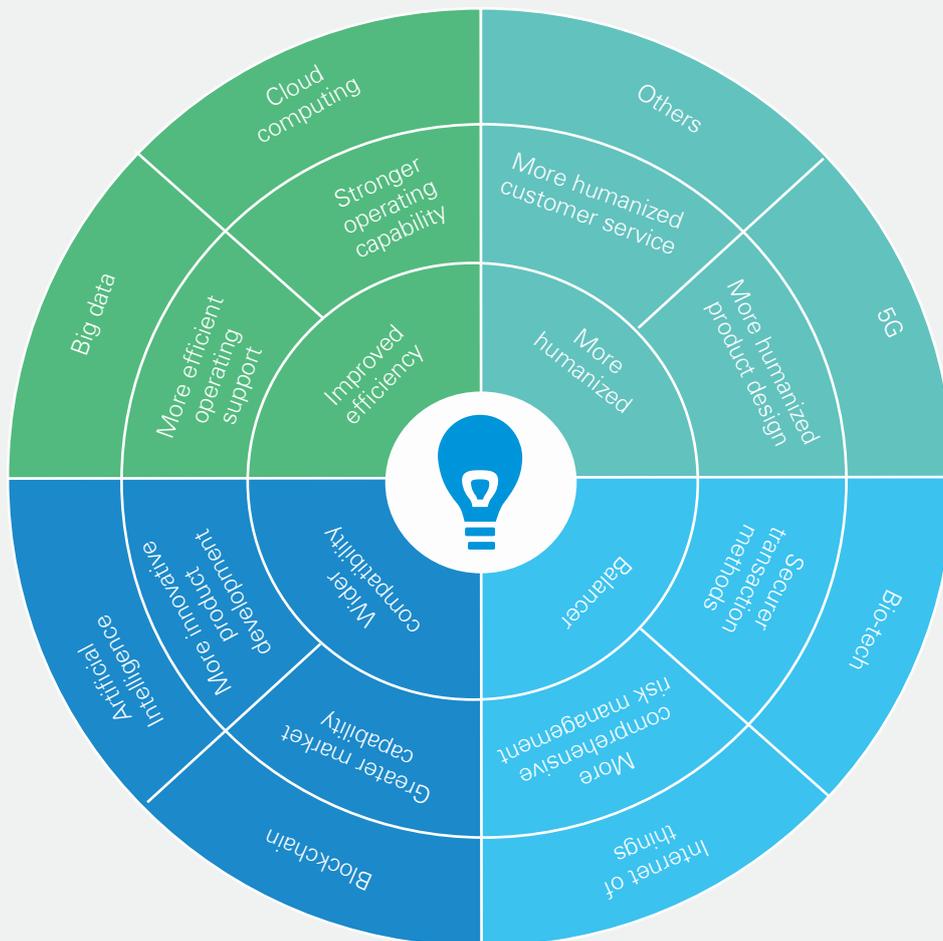
China's insurance industry started by studying and imitating the traditional Western insurance business model. During China's historic economic and social leap, the vigorous development of a great many technology companies—especially Internet companies—has promoted the continuous ascendance of China's insurance industry. As a result of increasingly mature innovations and applications in the areas of cloud computing, big data, artificial intelligence, blockchain and the Internet of Things, China's insurtech is leading the world.

A science and technology-driven strategy not only facilitates national economic and social development—it also serves as the foundation and driving force for international competitiveness. The Chinese insurance industry should seize these historical opportunities for development, increase investment in insurance technology, and strengthen China's leading edge in insurtech. The Chinese insurance industry should strive to become a global leader and rule maker in global insurtech development and promote China's voice in the global economic governance system, while also ensuring the steady and rapid development of the industry.

03

The New System: Upgrading and Improvements Empowered by Insurtech

Technology, together with regulations and market rules, provides the infrastructural support for the operation of the *new insurance* system. As the “hardware” component, technology empowers market participants and shapes the market in a way that makes it more efficient, diverse, and humanised. At the same time, regulations and market rules—as the “software” component of the infrastructure—ensure sound, stable and safe market operations with the help of technology. By building the system in a comprehensive manner and using technology as an important component in its infrastructure, we can fully empower market participants; and insurance institutions, regulators and consumers can have sufficient tools at their disposal to operate in and promote the *new insurance* system, ultimately benefitting all market participants.





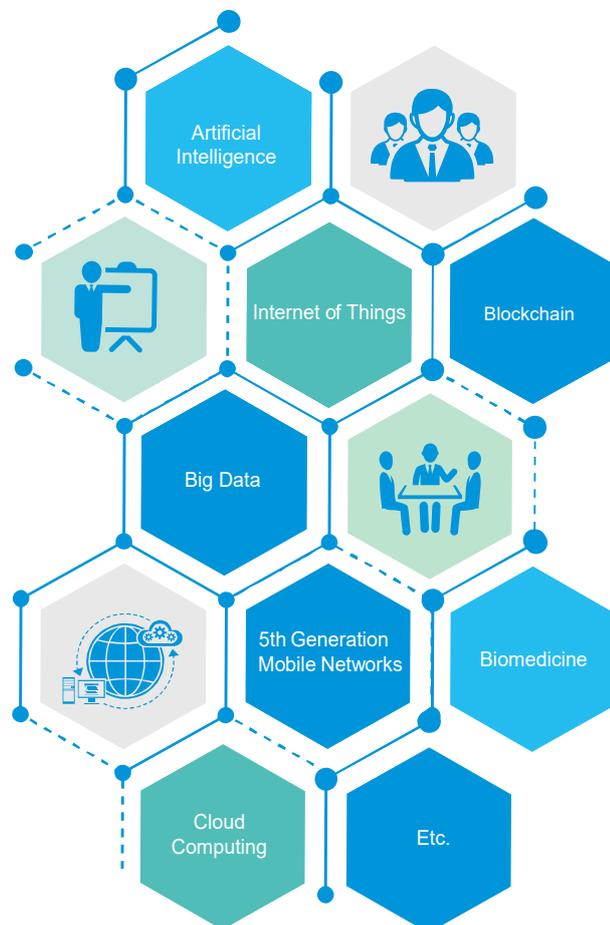
1. Core Technologies

The insurance industry has gradually applied various new technologies as it works to transform its existing operations. However, in the *new insurance* era, business volume will increase exponentially, and consumers with diversified needs will require rapid responses. For this reason, the market not only needs to operate more efficiently, it also needs to ensure its stability and equality. This entails extremely high requirements be imposed on the underlying infrastructure with regard to technology, regulations and market rules. Among these components, technology, as the hardware, will directly drive industrial transformation. Technology will serve as the hub that connects all market entities, and it will transmit regulations and market rules.

At present, new technologies that impact the insurance industry in a significant way mainly include cloud computing, big data, artificial intelligence, blockchain, and the Internet of Things. Among these technologies, the computing capabilities provided by cloud computing have served as an important basis for the realisation of other technologies. For instance, as cloud computing technology has developed, the demand for the accumulation, management and analysis of large amounts of data has stimulated the demand for big data technology. Based on the computing resources of cloud computing and the data resources of big data, the practical application of artificial intelligence came to fruition. Later, blockchain and the Internet of Things emerged, both of which have incorporated various innovative technologies, applications and ideas. These latter two technologies have been driving the development of information technology in general, and they will push forward the development of the insurance industry in the future.

In addition to these new technologies, developments in many other fields have also brought tremendous changes to the insurance industry. In the bioscience and biomedical fields, the emergence of genetic testing, genetic diagnosis and genetic treatment has introduced new challenges and posed new questions for the future development of health insurance. The popularisation of technologies such as remote diagnosis and treatment will also impact the organisation and operation of insurance companies. Although 5G technology will not have a direct impact on the insurance industry, it will integrate with the aforementioned technologies and promote their development, especially for the Internet of Things. Therefore, 5G will have a significant impact on economic operating models and society as a whole, and in this way it will impact the development of the insurance industry.

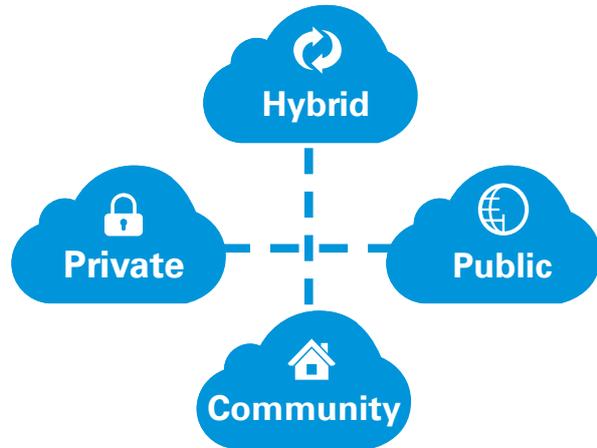
The integration of these new technologies has made insurtech possible. As the infrastructure for the *new insurance* system, insurtech will shape the system in the context of new economic situations, market patterns and industrial challenges, and provide strong momentum for the future development of the insurance industry.



1.1 Cloud Computing

Cloud computing provides access to computing resources (servers, storage, applications, services, etc.) over a network in a convenient, pay-as-you-go model. Cloud computing uses shared pools of configurable resources that can be rapidly provisioned with minimal management effort and with little interaction with the service provider.

With the emergence of cloud computing, computing resources have evolved into a kind of public service product like water or electricity. Consequently, cloud computing has become an important component of business infrastructure in the information age. Through cloud computing, information spread across various types of terminals can be integrated more conveniently. Cloud computing's powerful resources make it possible to collect, transfer, store, process, analyse, retrieve and apply large amounts of data. In this way, cloud computing has helped big data technology to develop and mature. Additionally, cloud computing has helped with the development and adoption of data applications such as artificial intelligence and blockchain.



Cloud computing service providers mainly provide the three following service models: infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS).

In terms of deployment, cloud computing can generally be divided into four types: private clouds, community clouds, public clouds and hybrid clouds. Among these, the hybrid cloud has become the most popular in recent years because it can balance the data security of private clouds with the computing resources of public clouds.

	Traditional IT	IaaS	PaaS	SaaS
Self-management	Application	Application	Application	Application
	Data	Data	Data	Data
	Runtime	Runtime	Runtime	Runtime
	Middleware	Middleware	Middleware	Middleware
	Operating system	Operating system	Operating system	Operating system
	Virtualization	Virtualization	Virtualization	Virtualization
	Server	Server	Server	Server
	Storage	Storage	Storage	Storage
	Network	Network	Network	Network
		Service provider management	Service provider management	Service provider management



After more than a decade of commercial development, cloud computing has been extensively applied in many industries including communications, medical care, education, government affairs, transportation, finance, e-commerce, and others. This technology has effectively solved many shortcomings of traditional IT technology such as high input costs, large workloads, inflexible resource allocation, and insecure data security.

In addition to solving IT issues, cloud computing has brought many other changes to the insurance industry. With the help of cloud computing technology, insurance companies have moved many of their business processes online. Online business development and mobile claims have also been widely promoted in the industry. With cloud computing's ability to integrate various data resources, insurance companies have been able to implement more precise and intelligent operations in customer marketing, product development, risk pricing, and underwriting and claims. Especially during this stage in which the insurance industry is moving towards *new insurance*, cloud computing provides important support for the technological transformation of insurance companies. One might say that in the same way that insurtech is an important part of the insurance industry's infrastructure, cloud computing is one of the most important components of insurtech's infrastructure.

At present, the global cloud computing market is still at an early stage of development. Key technologies are constantly being improved; products are being innovated; service capabilities are continuously being upgraded, and the industrial ecosystem is gradually taking shape. As the importance of cloud computing becomes clearer, more companies will embrace this technology which will accelerate the expansion of the global cloud computing infrastructure in turn. New technologies such as the Internet of Things and 5G will increase market demand for cloud computing and drive the development of related applications in the fields of artificial intelligence and blockchain. In this way, cloud computing and other new technologies will work together to support the insurance industry as it faces both internal and external challenges on its path to creating *new insurance*.



1.2 Big Data

Big data refers to data sets that are so large they cannot be captured, managed, and processed by conventional software tools within an acceptable timeframe. These data sets are massive, diverse and can grow quickly. The new technologies that are used to process these data sets can significantly enhance decision-making and greatly optimise business processes and management insight. The specific attributes that define big data are usually referred to as the four V's: volume, velocity, variety, and value.

Big data technology focuses on how to retrieve key information in order to support the decision-making process. Unlike traditional sampling analysis, big data analysis makes use of the full data set. Big data is generally divided into three types: structured data, semi-structured data and unstructured data. Among these, unstructured data is increasingly becoming the most important area. Therefore, in recent years, the mining and application of unstructured data has become an important development trend in the field of big data.

The development and application of big data is inextricably linked to cloud computing. In fact, cloud computing's powerful computing resources are what make the mining and analysis of big data possible. Without it, we would not be able to extract value from these massive data sets for use in the decision-making process. At the same time, big data is an inevitable outcome of the continuous development of cloud computing. The need for the collection, management, processing and application of massive amounts of data is driving the continuous development and improvement of big data technology.

As an important type of insurtech, big data is also an important part of the infrastructure underlying the ongoing development of the insurance industry. Through the analysis of full data sets as opposed to sampled data, big data technology provides more accurate analysis results for insurance companies to optimise product design, actuarial pricing, customer service, marketing and promotion, and other processes; and just as importantly, it provides new perspectives and ideas. For example, with the multidimensional analysis features provided by big data, a clearer and more comprehensive customer portrait can be created. Using big data, many insurance companies have achieved good results in cross-marketing and customer service. Additionally, through the mining and analysis of data in more enhanced scenarios, insurance companies have been able to develop more specialised insurance products, such as weather insurance based on analysis of meteorological data, health management-oriented medical insurance based on sports data recorded by wearable devices, and return shipping insurance based on analysis of web browsing and shopping behaviour data.



Presently, the insurance industry has formed a relatively complete big data ecosystem that covers insurance companies, third-party insurance platforms, brokers, agents, business partners, related data and technical support parties. Additionally, with scrutiny increasing on issues such as consumer protection and data privacy, the role of regulators in the big data industry ecosystem is growing.



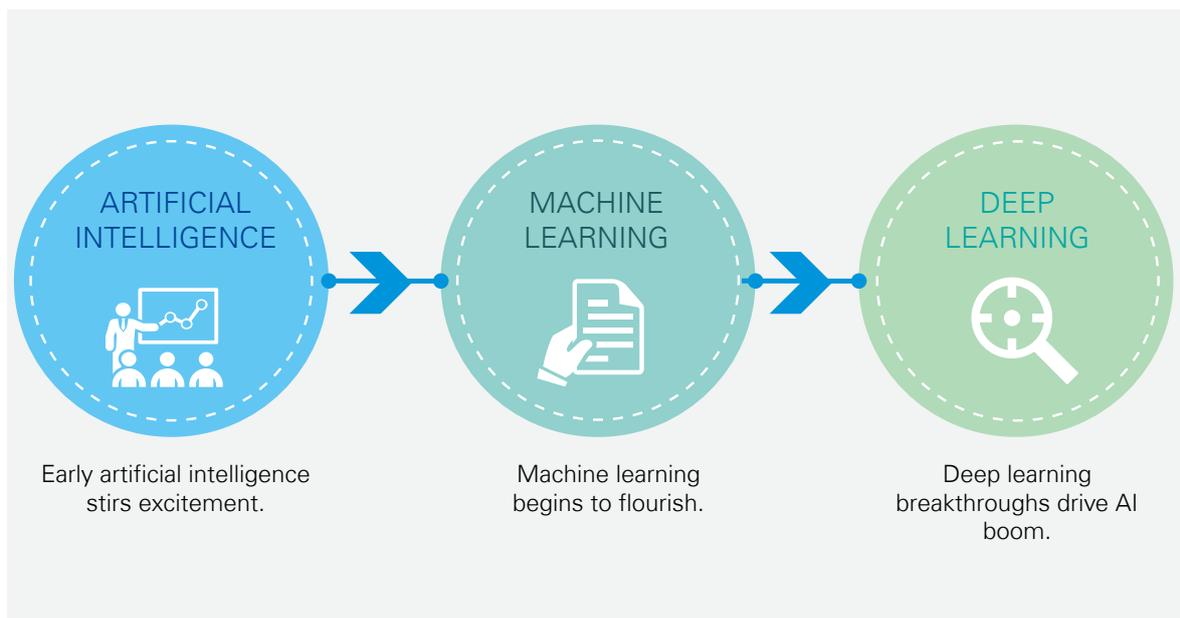
1.3 Artificial Intelligence

Artificial intelligence (AI) is a branch of computer science that studies and develops theories, methods, techniques, and application systems for simulating, extending, and expanding human intelligence. Artificial intelligence research is being conducted in a wide range of fields, including knowledge acquisition, perception problems, pattern recognition, neural networks, complex systems, genetic algorithms, and other areas. The most important artificial intelligence research involves four major technologies: computer vision, machine learning, natural language processing and human-computer interaction.

Artificial intelligence has been made possible through the integration of multiple types of technology. Current developments in the field of artificial intelligence are based on cloud computing and big data. By harnessing cloud computing’s powerful resources in conjunction with iterative big data algorithms, companies can better extract value from massive data sets.

Artificial intelligence research is complex, and the application possibilities are numerous. Although artificial intelligence is still in its early stages and the technology is only proficient in addressing problems that are specific and unilateral, it has displayed great value in many respects. At present, the fastest growing and most widely-used areas of artificial intelligence are machine learning, image recognition and intelligent robotics.

In the insurance industry, artificial intelligence has been applied in many types of scenarios and has brought about many positive changes. For example, artificial intelligence applications that interact with customers have helped insurance companies in the areas of online customer acquisition, marketing and promotion, customer service, and claims automation. In underwriting and claims, artificial intelligence applications can determine and record the authenticity of information provided by customers (e.g. documents, recordings and images), thereby speeding up operations while mitigating the risk of insurance fraud.



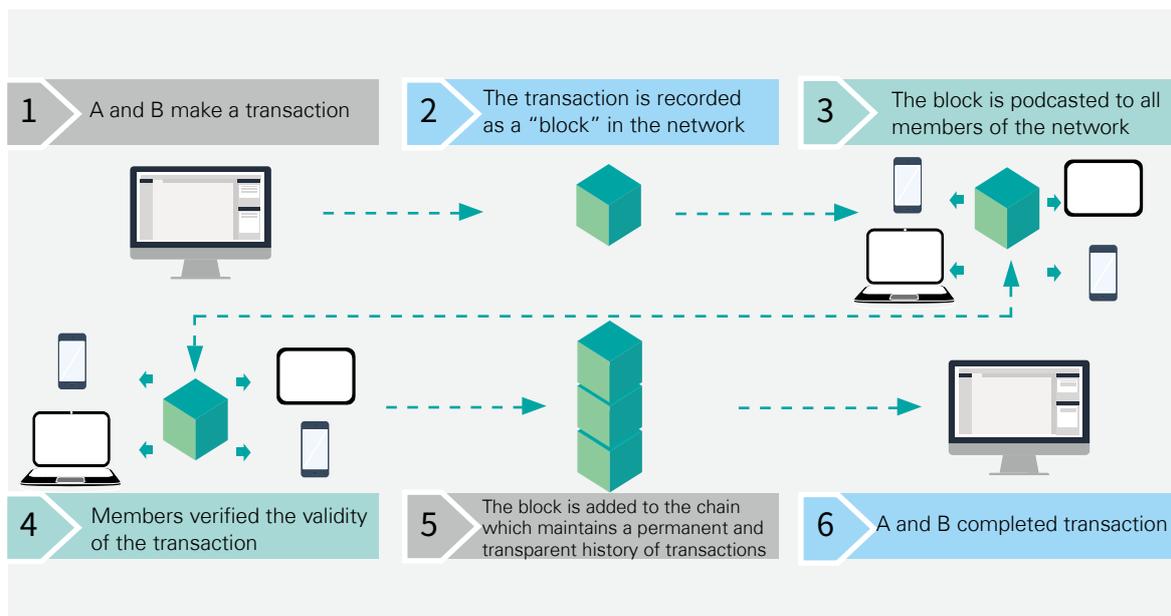
1.4 Blockchain

Blockchain is a new application of computer technology that features distributed data storage, point-to-point transmission, consensus mechanisms, encryption algorithms, and other capabilities. Blockchain technology has six characteristics: decentralisation, openness, transparency, anonymity, data immutability, and autonomy. It is considered to be one of the most disruptive innovations since the Internet coined. The core strength of blockchain technology lies in its consensus mechanism, which is based on distributed networks.

Blockchain's distributed network characteristic allows for remarkable openness and expandability, which effectively reduces the barrier to entry for businesses. Additionally, the independent nature of its consensus mechanism enables it to improve its effectiveness while reducing costs. For these reasons, blockchain technology presents great opportunities and possibilities to a range of industries and sectors.

At present, blockchain applications in the insurance industry are mainly focused in the areas of product development, risk prevention, process optimisation and mutual insurance. These applications are transforming the value chain and process chain of the insurance industry as a whole. For example, traditionally insurance companies conduct product sales and management at the policy level, and customer information is quite dispersed. Using blockchain-as-a-service (BaaS) capabilities, insurance companies can integrate customer information from various channels, unify management of customer accounts, and achieve effective data sharing. In these ways, companies can speed up processes and become more efficient. Blockchain technology also allows for quick identity and information verification, and enables enterprises to collect and store data off their premises according to their needs, which can allow authorised third parties to sort and analyse data when necessary. In instances in which policyholders change their insurance companies, blockchain technology can help ensure data continuity. Additionally, since blockchain data cannot be modified, it offers significant anti-fraud value, which can reduce risk management costs for insurance companies.

Blockchain is an important part of the insurance industry's infrastructure. Going forward, it will continue to integrate with big data technology, artificial intelligence and the Internet of Things; and together they will foster more innovative applications and help build the insurance industry of the future.



1.5 The Internet of Things

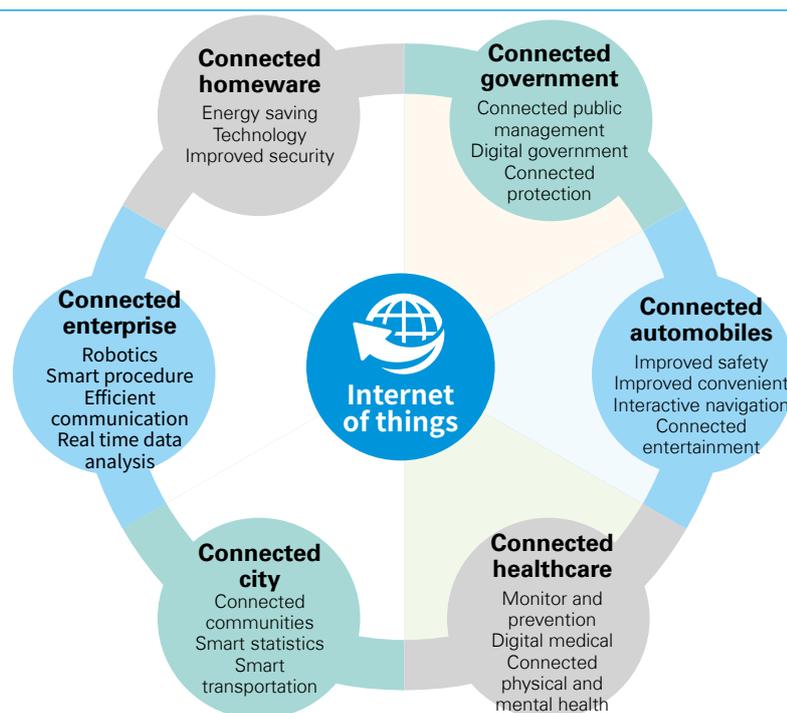
The Internet of Things (IoT) is a network of physical objects that can collect and exchange data. These objects transmit data through various information sensing devices such as QR code scanners, radio frequency identification (RFID), infrared sensors, global positioning systems, and laser scanners in order to enable intelligent identification, location, tracking, monitoring, and management.

The Internet of Things is an important part of the next generation of information technology, and it constitutes a new stage in the development of the information age. The Internet of Things has fundamentally changed the relationship between the Internet and physical objects. Traditionally, physical infrastructure is separated from IT infrastructure. Airports, roads, and buildings are examples of the former; and data centres, personal computers, and broadband are examples of the latter. In the IoT era, concrete and cable will be integrated with chips and broadband, and this combination will function as a unified infrastructure on which the entire world will run. It will underlie economic management, production operations, social management and even people's personal lives.

The emergence of the Internet of Things has provided a tipping point for industrial developments like smart cities, smart homes, wearable technology, and telematics. It has significantly strengthened people's ability to collect, integrate, process and analyse data, which has brought tremendous changes to many industries.

In the insurance industry, the main issue that hinders the accurate pricing of insurance products is the inability to accurately obtain comprehensive risk data, especially risk data for certain segments and customer groups. The Internet of Things will help to mitigate this situation. For example, by using data from smart home devices, it is possible to accurately track gas leaks in a house to mitigate fire risks. Additionally, wearable technology can track customers' lifestyle traits, allowing health insurance products to be tailored to suit groups at different risk levels. Through telematics, we can track user's driving behaviour and more accurately price auto insurance.

Currently, insurance companies have developed some IoT-related products, such as usage-based insurance (UBI). As the Internet of Things develops further, this technology will introduce more and more market opportunities to the industry.



1.6 Biotechnology

Biotechnology refers to the use of biology for the purposes of producing scientific and technological applications that benefit society. Since the start of the 21st century, biotechnology has developed rapidly, and modern medicine's understanding of life and the nature of disease has gradually evolved from the symptomatic level to the molecular level, which has led to significant changes in insurance products and industry risk management.

Biotechnology can improve risk management in the risk screening process. For example, biomarker indicators and other early detection technologies can be used to detect, diagnose and treat cancer in a more timely manner, which can in turn significantly reduce cancer mortality rates. As technology matures, insurance products and technologies such as biomarker cancer screenings will be integrated even more closely. The development of genetic testing technology has enabled professionals to predict the probability of disease occurrence and has greatly improved screening efficiency for genetic diseases. These advances will bring profound changes to the insurance industry. Additionally, the introduction and improvement of new treatment methods such as gene therapy and synthetic organs will also enrich and expand insurance product offerings. In the future, insurtech will be combined with biotechnology and health management to reduce costs and design more effective insurance products.

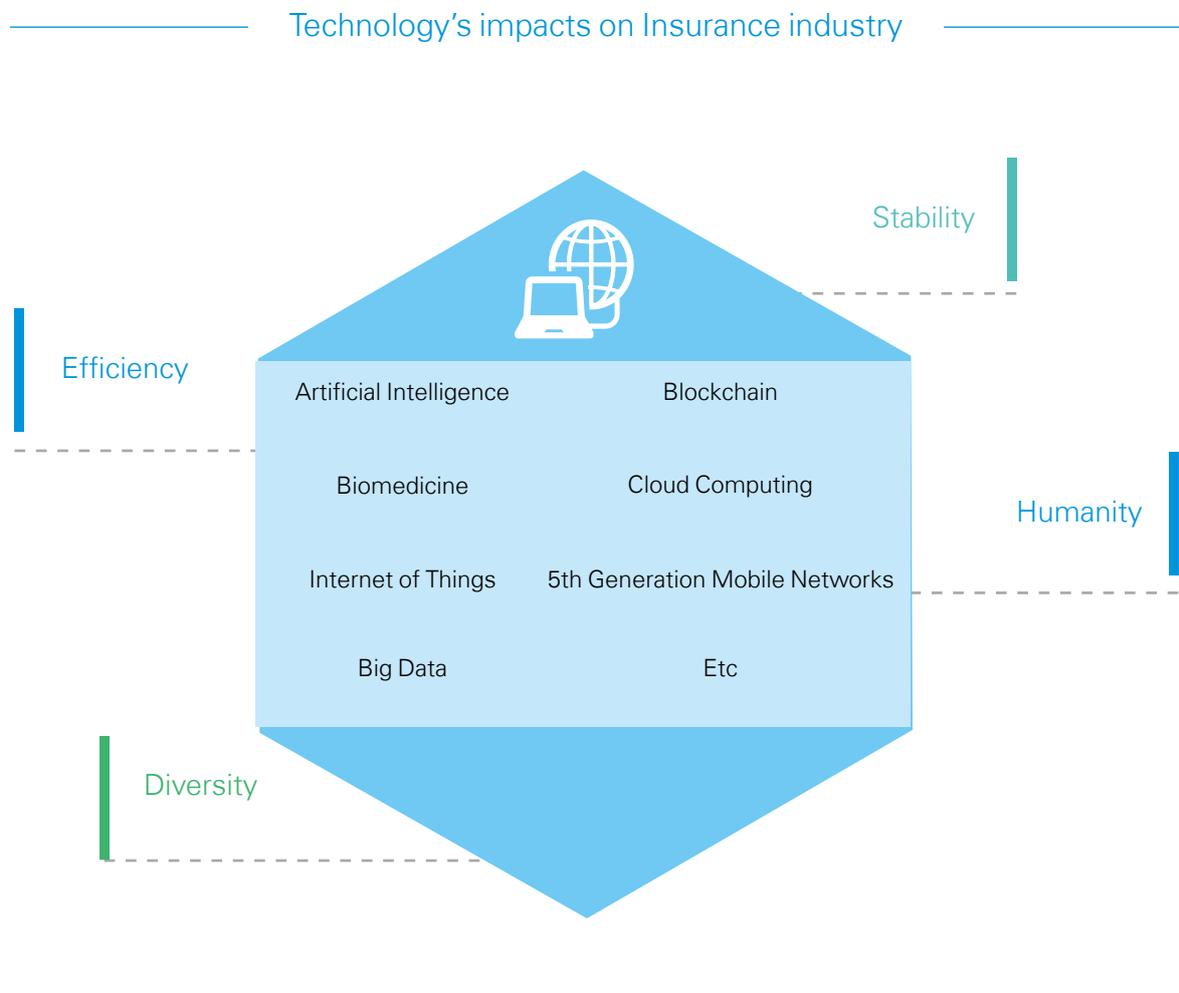




2. Insurtech and *New Insurance*

2.1 The Market

The rapid development and integration of technologies has influenced every link in the underwriting process, better equipping insurance institutions to become more efficient, compatible, balanced, and humanised.



1) Efficiency

Effective rules and regulations are a vital part of any efficient market; and insurance institutions, as key market participants, play an important role in ensuring the efficient operation of the market. In the *new insurance* system, insurance companies will use technology to gain **greater operational capabilities** and **more efficient operational support**. These advances will enable insurance companies cope with challenging business needs, be more competitive, and operate in a more technology-driven and intelligent manner.

i. Greater operational capabilities

As the insurance industry continues to adapt to different Internet scenarios, insurance products for the Internet ecosystem continue to innovate iteratively, from simpler products such as return shipping insurance to more diverse and complex products. Among these products, those that involve greater scenario fragmentation, higher customer interaction, stricter time limits, and greater sales fluctuations between business peaks and valleys place extremely high demands on the operational capabilities of insurance companies. With the support of emerging technologies such as cloud computing and big data, insurance companies' operational capabilities have been comprehensively upgraded in the following five areas:

More flexible resource allocation: Traditionally, insurance companies' core business systems have relatively fixed computing resources, and these systems tend to rapidly expand and retract these computing resources. In particular, the time it takes to scale-up resources is long and lacks flexibility, which renders the systems ineffective in meeting the rapidly changing resource demands of Internet services. Relying on cloud computing's nearly-infinite computing resources, insurance companies can quickly deploy resources to optimise business processes in the face of highly time sensitive, fluctuating, and fragmented computing resource demands.

Faster response: When it comes to Internet scenarios, services and operations are generally more time sensitive. By combining cloud computing and big data technology, insurance companies can ensure that data processing is conducted in a timely and efficient manner, while also meeting the real-time computing needs of their business operations in various complex scenarios.

Stronger business capacity: Internet insurance's high-frequency, low-value, and fragmented nature presents significant challenges to insurance companies' business support capabilities. Using e-commerce as an example, on the day of November 11, 2017 (also known as "Double 11 Day"), Tmall alone received more than 800 million orders, with volume peaking at an astounding 325,000 transactions per second. For this reason, the return shipping insurance provider that supports Tmall needed to have strong technological capabilities. Using technologies such as cloud computing, big data and artificial intelligence, insurance companies can not only conduct underwriting processes in real time—they can also offer personalised pricing to specific insured entities (buyers and sellers) and individuals in real-time. By harnessing the power of new technologies, insurers have built the capabilities necessary to carry out the operational processes that underlie these innovative Internet products.

More comprehensive product range: After developing for nearly a decade, online insurance products have developed from simple return shipping insurance products to products that cover many areas such as accidents, health, credit guarantees, account security, and transaction security, covering a wide range of consumption scenarios. Achieving centralised business operations that are able to support the requirements of various scenarios, timeframes, resources and product

operations has presented a great challenge to insurance companies. With the support of technologies such as cloud computing, big data, artificial intelligence, the Internet of Things and blockchain, insurers can build a more comprehensive operational support system for their products, gain various technological advantages, and adapt to different operational needs.

Smoother workflow: Diverse scenario requirements, diverse product types, multi-level product operations, and multi-dimensional risk monitoring have all raised the requirements for insurance companies' business operations. By leveraging the powerful resources of cloud computing in conjunction with the analysis and processing capabilities of big data, insurance companies can collect business process data in a more complete manner and build a more comprehensive business monitoring system; and in this way, they can continuously improve their business processes and adapt to the higher operational requirements of the Internet.

Return Shipping Insurance

ZhongAn Insurance and Taobao

Technologies:	Big data, cloud computing and artificial intelligence.
Technologies:	Return shipping insurance features dynamic and personalised pricing. When the customer places an order, the company's model calculates the premium according to customer and store information in real-time and displays it on the product payment page immediately. This process requires significant data, computing and algorithmic capabilities. Return shipping insurance is characterised by great fluctuation in transaction volume and extremely high computing resource requirements during peak periods.
Product:	Return shipping insurance is designed for e-commerce scenarios. Its original purpose was to solve issues related to freight disputes between buyers and sellers during the return process. After purchasing goods on Taobao, you can check the return shipping insurance information on the payment page. If you return the goods, the insurance company will pay a certain amount of the freight cost. Currently, this insurance product features a buyer's version for the customer and a seller's version for the merchant.
Product characteristics:	<ul style="list-style-type: none"> Large volume: In 2017, the industry provided 6.8 billion return shipping insurance policies. Volatility: During the November 11, 2017 shopping spree, ZhongAn Insurance provided over 300 million policies in a single day. Personalised pricing: The pricing model for this product features tens of thousands of parameters that cover a variety of areas including customers, products, transaction records, and logistics information. The model then considers order-related information in order to achieve personalised pricing for specific individuals and entities. Dynamic pricing: Prices are measured and quoted in real-time. Significant time requirements: On average, 3,500 policies are underwritten every second, and during peak times this rate can be up to 100 times higher.

Source: ZhongAn Fintech Institute

Credit Guarantee Insurance in Supply Chain Finance

Technologies:	Big data, cloud computing and artificial intelligence. The frequent and dynamic nature of e-commerce shopping puts the inventory of merchants in a state of constant flux. These inventory products fall into complex categories; and their value must be continuously measured and quoted in real-time, which requires significant computing resources.
Product:	Credit guarantee insurance in supply chain finance is designed to address e-commerce financing needs. The insurance company issues insurance products that correspond to the loan demand of the merchant. Due to the large inventories involved in e-commerce, inventory volumes change rapidly, and the available loan amounts must change in real-time. The loan amounts in e-commerce contexts are calculated in real-time and result from models that take into account brands, inventory turnover rates, and sales rankings. Generally, the following formula is used: real-time inventory level * minimum price over a 60 day period * discount ratio.
Product characteristics:	<ul style="list-style-type: none"> Large warehouse inventory: In order to support large-scale e-commerce activities, e-commerce platforms procure inventory in large amounts, and transaction volumes are usually large. Continuous inventory change: Inventory is in a constant state of flux due to the continuous sale of goods in the warehouse and irregular procurement. Dynamic pricing: The continuous changes in inventory lead to constant changes in the amount of financing needed to secure the inventory.

Source: ZhongAn Fintech Institute

ii. More efficient operational support

Technology development has introduced profound changes to the insurance market. The demand for timely, fragmented and small-scale Internet scenarios has imposed higher requirements than ever before on insurance companies in terms of operational efficiency, quality and costs. In the future, new technologies will produce new scenarios, media and business models. These developments will pose more and more challenges to the operational support capabilities of insurance companies. Because insurance is essentially a service industry, every stage of an insurance company's value chain needs to be enhanced in terms of operational support. With the application of new technologies, insurance companies can build efficient and effective operational support under the framework of the *new insurance* business model. More specifically, using technology to build more efficient operational support for insurance companies provides the following benefits:

Increased operational efficiency: With the support of new computing resources and technologies, insurance companies have significantly improved their traditional business processes. Reduced manual input, increased automation, reduced service time and space constraints, and the diminishing marginal cost of resource inputs all go a long way toward helping insurance companies achieve large-scale business growth; and they require relatively small investments. The three most prominent effects of these developments are process automation, intelligent operations, and business agility. The first is process automation. Through technology applications such as cloud services, smart customer consultants, intelligent customer service robots and other technical products, insurance companies have been able to implement more holistic online operations for more products and services. For complicated insurance products that still require significant offline operations, 24/7 automation has been achieved in more process stages, greatly improving process efficiency while reducing manual input. The second aspect is intelligent operations. For example, by combining drone and satellite technology with AI image recognition, insurance companies can accurately assess losses and settle claims relatively quickly. The third aspect is business agility. 5G and IoT technology will enable the real-time transmission of massive amounts of data between all links in an insurance company's processes, making operational support significantly more agile.

Optimised operational quality: Through the application of technologies such as big data and artificial intelligence, business operations—in terms of monitoring, triggering, responding and processing—will be significantly faster and more accurate. Especially in cases in which there are massive and highly-frequent business requirements, technological support will greatly benefit operational quality, mainly in three aspects.

First, technology will reduce risks in business operations. By replacing a large amount of manual labour with technology, operational risks can be effectively reduced. For example, by using mobile smart devices to directly input and manage customer information, we can reduce issues related to inaccuracies and missing information that tend to appear when paper documents are being re-entered into computer systems. Second, the timeliness of business monitoring can be improved. Using big data's real-time data processing capabilities, business managers can quickly identify and locate various risk events that occur during operational processes so that corresponding risk mitigation measures can be taken quickly. Finally, new technologies can provide the insurance industry with information that is currently difficult to obtain in order to improve customer service experiences. For example, with the help of voice emotion analysis technology, personnel who are providing customer service over the phone can get information on the customer's real-time emotional status, and corresponding scripts and process guidelines can be provided to the personnel. In this way, customer service quality can be improved, and customer complaint rates can be reduced.

Reduced operating costs: Technologies such as cloud computing and big data make accessing computing resources cheaper and more convenient than ever before. Insurance companies can obtain basic IT infrastructure from cutting-edge technologies without maintaining a large technical team. Especially in the highly flexible environment of the Internet, insurance companies can use cloud computing to allocate resources on demand, reducing the need to maintain resource-intensive investments in the long term. In this way, significant operational cost savings can be achieved. Using technologies such as artificial intelligence and the Internet of Things, insurance companies have further improved their standardisation and automation in the areas of customer service, product pricing, underwriting, claims investigation, service and recovery. Particularly in business areas with high labour costs—such as loss assessment, customer service and sales consulting—using applications like drones, smart phones, text recognition, image recognition, voice emotion recognition, intelligent voice robots and intelligent care robots can effectively replace human input and effectively control labour costs. In this way, insurance companies' operations can be made more efficient, freeing up more resources and profit margins.



PingAn Smart & Instant Compensation

PingAn Insurance

Technologies:

Artificial intelligence, cloud computing and big data.

The intelligent loss assessment process uses a deep learning algorithm based on convolutional neural networks to analyse massive amounts of data and automatically determine losses based on images. At the same time, due to business volume, the company needs to complete a large number of these loss assessments accurately, quickly and professionally.

Product:

Smart & Instant Compensation combines image recognition technology with the risk leakage rule model. This system has transformed the entire traditional claims process—from reporting to payment—into a self-service process. After the customer uploads pictures of the vehicle damage, the system automatically determines the part of the vehicle that was damaged. It then provides repair opinions on that part, sends the information to local repair shops, and displays their working hours and price quotes.

Product characteristics:

- **Determines losses with the click of a button:** After the customer takes pictures of the damage to the vehicle, the system automatically determines which part of the vehicle is damaged and produces a repair plan and price quotes.
- **High-precision picture recognition:** The system recognises all passenger cars, all exterior parts and delineates between 23 loss levels with an accuracy rate of over 90 percent.
- **Automatic and precise pricing:** The system can communicate instantly with local repair shops to get price quotes and working hour information.
- **Intelligent risk control:** The entire claims process is automated. More than 30,000 digital claim risk control rules have been developed to reduce manual input and effectively control risks.

Source:https://www.sohu.com/a/206944410_454338



Drones for Agricultural Loss Assessments, Loss Surveys and Claims

China Insurance

Technologies:

Artificial intelligence, big data and cloud computing.

By using unmanned aerial vehicles (UAVs), also known as drones, land can be monitored and photographed from the sky. Using big data and artificial intelligence technology, processed by specialised software algorithms, we can cull quantitative information from aerial photography and video data in order to analyse crop growth, disaster areas and other relevant land areas.

Product:

To solve the problem of time-consuming and inaccurate loss assessment in agricultural insurance, companies can use drones to gain a panoramic view of farmland. By using UAVs in conjunction with other equipment, companies can analyse affected areas and damage more accurately and objectively.

Product characteristics:

- **Fast loss assessment:** In the summer of 2015, the drought in Hebei province caused a major reduction in corn production in 11 cities. Insurance companies used UAVs in conjunction with handheld terminals to confirm affected areas totalling approximately 2.06 million mu (a Chinese unit of measurement, 1 mu=0.0667 hectares). The total indemnity was determined to be RMB 400 million, benefiting 575,000 farmers. A drone can take off and begin surveying 30 minutes after it reaches the survey site. With each flight, a drone can survey an area of 22,500 mu.
- **Accurate claims:** UAVs can be equipped with photographic resolutions of up to 3 to 5cm. They are supported by a data analysis platform that includes GIS, image interpretation software and expert agricultural knowledge.

Source:<http://news.carnoc.com/list/294/294184.html>



A Leading Japanese Life Insurer's Use of IBM's Watson AI system

Fukoku Mutual Life Insurance

Technologies:

Artificial intelligence, cloud computing, big data, the Internet of Things.

Through natural language interaction, IBM's Watson AI platform can process and recall large amounts of data and transform it into useful formats through big data and cloud computing technologies. By collecting and analysing data from policyholders, insurance companies can use this technology to customise insurance products for individual customers. Used in conjunction with the Internet of Things, insurers can further reduce costs, optimise operations, manage risks, and customise products.

Product:

By using the IBM Watson AI system, insurance companies can intelligently analyse and understand various data forms including text, video and others. Companies can also use this technology to collect information and materials for the insurance claims process, for example by using it to read medical certificates written by physicians. The Japanese insurance company Fukoku Mutual Life Insurance uses the Watson AI system to process insurance claims and check insurance contracts.

Product characteristics:

- **Fast and accurate claims:** The Watson AI system can check and collect different bits of information at the same time, far outpacing manual processes.
- **Cost reduction:** The Watson system has the potential to replace nearly 30 percent of the company's manpower. The initial investment in the system was about JPY 200 million, and annual maintenance costs are about JPY 15 million, ultimately saving the company roughly JPY 140 million a year.
- **High efficiency loss assessment:** With the help of Watson, the insurance company's loss adjusters are 25 percent faster at assessing claims. The system is expected to check a total of approximately 132,000 cases each year.

Source:<http://tech.huanqiu.com/news/2017-01/9895583.html>

2.2 Compatibility

The continuous improvement of the technological capabilities of market players has enabled the formation of a diversified market. Under the *new insurance* system, insurance companies can develop innovative products that more effectively address consumer needs and provide better insurance solutions for complex needs such as those related to inclusive and emerging risks. Multi-level product systems will gradually take shape and meet the diversified needs of the overall market. At the same time, insurance companies can use new technologies to enhance their service capabilities and also extend their related upstream and downstream services. Other scientific and technological companies can also play a role by providing users with different insurance services in niche markets. In this way, the entire market will be enriched and energised.

i. More innovative product development

The application of innovative technology provides insurance companies with new ways of thinking and new solutions as they explore market demand. New technologies use different product development strategies and pricing models to address product development problems that cannot be solved using traditional methods. In this way, companies can create a multi-level *new insurance* product system.

Technology-driven product development and innovation has mainly enabled by the following three capabilities:

Data collection: Since the advent of the Internet era, data resources have accumulated rapidly around the world. In the era of mobile Internet, the dimensions and quantity of data resources have been enriched by the rapid increase in Internet-connected devices. As innovative technologies such as 5G, the Internet of Things and blockchain continue to develop, data resources that cover all parts of society will be made even more available, and they can be used to support insurance product development. For example, after accessing data from IoT devices such as manufacturing equipment, smart homes, wearable technology, and telematics, insurers can develop products that are more innovative and can conduct actuarial pricing more accurately in various traditional and new scenarios.

Data application: The development and pricing of traditional insurance products mainly depends on the law of large numbers. Due to data processing limitations, data selection and measurement are often carried out through sampling. However, in an environment where data types are complex and multi-dimensional, sampling is often unable to meet the needs posed by precision pricing and rapid product development. With technologies such as cloud computing and big data, product developers can analyse the full data set; and in this way, they can conduct a more comprehensive risk assessment based on complete performance data, and develop insurance products that better meet market needs.

Development tools: Algorithms lie at the core of artificial intelligence. The continuous evolution of algorithmic capabilities is driving the development of artificial intelligence technology. In conjunction with big data, these capabilities provide more convenient and reliable tools for model construction and insurance pricing product development. Through analysis and deep learning, AI-based actuarial calculations can provide more accurate risk control solutions and pricing models, and customise policies for customers. In this way, these new technologies have greatly improved product development in the insurance industry, particularly with regards to small-scale, highly-frequent, and fragmented scenarios.

With the help of new technologies, technical tools have been continuously optimised, enabling insurers to have a better understanding of customers and risks. With this understanding, insurers are better able to update and improve existing products, improve the overall product process, better meet consumer needs, increase the value of insurance products, and improve market acceptance of products. Additionally, using this technology insurers have the ability to explore insurance needs in more scenarios and in different ecosystems, and in this way, develop more diversified products and service systems for new risks and demands, and expand the market for insurance. Finally, for products that are difficult to develop—for instance in the inclusive finance sector—the traditional pricing model cannot sufficiently support product development, and significant insurance needs in the long-tail market cannot be fully satisfied. With the help of new technologies, insurers can more effectively leverage multi-dimensional data and address diverse risks, and ultimately provide more diversified and inclusive insurance solutions.



OBD Auto Insurance

Technologies:

Artificial intelligence, the Internet of Things, big data and cloud computing.

On-board diagnostics (OBD) enable insurers to analyse consumer driving habits for the purpose of designing different products and obtaining guidance on multi-dimensional auto insurance pricing and service promotion. This technology features extremely high requirements in terms of on-board equipment, data acquisition and algorithms.

Product:

OBD is designed to collect behavioural driving data and use it as a basis for providing differentiated pricing with reference to factors including driving habits, driving areas, family, credit, driving history, and social activities. Additionally, OBD can provide real-time location positioning, provide safety reminders to drivers, help consumers develop better driving habits, and enable insurers to provide more personalised services.

Product characteristics:

- **Multi-dimensional behavioural data:** OBD devices can record drivers' behavioural data with regard to driving habits, driving areas, driving history, and other relevant areas.
- **Personalised pricing:** Based on driver data, insurers can use multi-dimensional factors such as family, credit, and social activities to accurately price products and services.
- **Real-time risk prevention:** OBD can be implemented in conjunction with Advanced Driver Assistance Systems (ADAS) to help users prevent accidents, thereby lowering risks and losses for insurers. Studies have shown that in dangerous situations, ADAS can warn the driver 2.7 seconds ahead of a potential accident, helping to avoid 90 percent of collisions.
- **Incentive mechanism:** Insurers can combine OBD with IoT and big data technology to obtain drivers' credit scores and data related to driving behaviour and violations. Insurers can then offer incentives to encourage consumers to develop better driving habits.

Source:http://www.sohu.com/a/192034363_260944



LONG Insurance's IoT Insurance

LONG Insurance

Technologies:

The Internet of Things, big data and cloud computing.

LONG Property & Casualty Insurance Company has developed precision pricing products based on IoT technology. These products record the insured object's usage information in real-time through the Internet of Things, thereby helping insurers achieve effective control, risk prevention and accurate pricing. These insurance products have extremely high requirements in terms of hardware and software systems, data volumes, and algorithms.

Product:

LONG Insurance Company's IoT insurance products use the Internet of Things to accurately record usage information in real-time through mobile sensing equipment. This usage information includes data related to start-up times, mileage, usage methods and equipment operation. This data is then uploaded to a cloud analysis system where it is used to predict the impact of such usage on future risks and determine the floating price of the insurance.

Product characteristics:

- **The Internet of Things collects a massive amount of data:** LONG Insurance Company has 300,000 connected devices and has collected an astounding 40TB of data. The company's insurance policy design process will benefit significantly from the data that has been collected.
- **Personalised pricing:** By understanding equipment risk status, customer risk appetites and customer behaviour, the insurer can more accurately identify and price risks.
- **Risk mitigation:** Using this IoT data, the insurer can identify in advance when equipment is at high risk or when equipment is being operated in high-risk areas. The insurer can then provide early warnings and intervention where necessary, and ultimately provide customers with more personalised risk solutions.
- **Improved customer experience:** Using these new capabilities, the company can better arrange resources for claims, loss assessment and rescue measures in advance and can remain on-call in areas where accidents occur often. In this way, the insurer can provide customers with better claims and after-sales services.

Source:http://www.sohu.com/a/192034363_260944

ii. Better industry capabilities

With the support of insurtech, insurance companies will have more intelligent tools to use for customer service, and their service scope and capabilities will extend to more areas. In order to change from insurance product providers to effective insurance ecosystem service providers, companies can provide consumers with more diverse choices and create more value on their own and also by working with their business partners. In addition, as the insurance industry develops rapidly, more technology companies that focus on insurance will enter the market, providing the insurance market with a variety of services.

Enhanced insurance service capabilities: The in-depth application of insurtech is enabling insurance companies to build more comprehensive market capabilities. Using these new technology products, insurance companies have greatly improved customer perception and enhanced their service capabilities, while also uncovering new market demand. Market acquisition capabilities are continuously strengthening, and the accuracy of services is also steadily improving. At the same time, these new technologies have increased the ways in which insurance companies and customers can interact—from traditional offline to online, from PCs to mobile, from independent apps to WeChat service accounts, then back to O2O when online returns to offline. Using technology, companies can provide customers with insurance services anytime, anywhere in a range of different scenarios.

Extension of upstream and downstream services: With the application of new technologies, insurance protection is no longer limited to the financial compensation provided after accidents occur. By continuing to integrate upstream and downstream resources, insurers can improve their service capabilities and provide users with more convenient and humanised services. For example, with regard to screen insurance for mobile phones and other electronic devices, after a claim is submitted the insurance company can dispatch its business partners to provide fast at-home repair and other useful services. At the same time, some insurance companies are investing in specialised technologies and developing niche market segments in order to provide more diverse non-insurance products and support their insurance business lines. Examples of this strategy include ZhongAn Technology Company established by ZhongAn Insurance, PingAn Technology Company and PingAn Good Doctor established by PingAn Insurance, and PICC Financial Services Company established by PICC Group. These technology companies are all attempts by insurance companies to develop more professional products and services through the use of technology. In addition, some insurance companies are investing in the health and medical fields in order to improve products and services related to their main health insurance business lines. All of these developments are manifestations of the insurance industry's greater market capabilities, which have been enabled by technology.

A comprehensive ecosystem: With the acceleration of technology-driven development, various insurance and technology companies have launched diversified services in various vertical markets. The service capabilities provided by the insurance industry ecosystem—comprised of the insurance industry and its various upstream and downstream participants—have been greatly enriched. Insurance companies have worked with various distribution channels to build a number of service support systems for different groups, including consumer-oriented smart care platforms, policy management platforms and agent-oriented service management platforms. These developments have enhanced the service capabilities of the entire industry. At the same time, in order to meet the business expansion needs of insurance companies, professional service providers in areas such as big data, fraud prevention, risk control, credit reporting and artificial intelligence have flourished, enriching the service capabilities of the entire insurance ecosystem. Innovations such as using flight information data for delay insurance; using invoice image recognition, text recognition, and verification services in the claims process; and using intelligent robots in customer service will continue to develop and become more commonplace. As science and technology continue to advance, the service capabilities of the insurance ecosystem will expand and diversify, resulting in a more comprehensive industry ecosystem.



Xiao Ai Insurance

People's Insurance Company of China (PICC)

Technologies:

Big data, artificial intelligence and facial recognition.

PICC's Xiao Ai Insurance technology uses massive amounts of data to analyse consumer needs and provide customers with the most suitable insurance products. This technology has high requirements in terms of data dimensions, data volume, neural networks and search algorithms.

Product Form:

Xiao Ai Insurance is a smart recommendation platform for insurance products. According to the Insurance Association of China, as of May 2018, there were nearly 190,000 insurance products offered in China, and nearly 23,000 of these were rated poorly. With so many insurance products, Xiao Ai Insurance can—with approval from the customer—accurately match customer portraits produced by big data technology with corresponding product portraits. In this way, the insurer can provide customers with the most suitable insurance solutions.

Product characteristics:

- **Big data analysis:** The platform must sift through huge amounts of insurance product data in order to match the right products with the right customers.
- **Intelligent insurance:** The Xiao Ai platform provides intelligent recommendations based on the specific needs of individual customers. Notably, with the help of intelligent customer service and claims technology, the platform is able to provide customers with intelligent closed-loop services throughout the entire insurance process.
- **Personalised service:** The Xiao Ai Insurance platform produces comprehensive customer portraits and product portraits, and provides suitable insurance products to customers according to their specific needs.

Source:<http://baijiahao.baidu.com/s?id=1604483636743224536&wfr=spider&for=pc>



Technology that Empowers the Market

ZhongAn Technology Company

Company profile:

ZhongAn Technology was established on 2 November 2016 and is a wholly-owned subsidiary of ZhongAn Insurance. ZhongAn Technology is a financial technology company specialising in cutting-edge technology research in areas such as blockchain, artificial intelligence, big data and cloud computing. The company aims to supply effective technology products and industrial solutions to its internal and external partners.

Product lines:

- ZhongAn Technology has 5 product lines: T series (blockchain), X series (data intelligence), S series (insurance technology), H series (healthcare) and F series (financial technology).
- **T Series:** Ti-Capsule (data safety storage), Ti-Sun (ID authentication), Ti-Packet, intelligent anti-forgery products, and others.
 - **X Series:** Visualisation, intelligent customer service, public opinion detection and analysis, a data insight platform, information verification, light consulting on risk management, an intelligent marketing platform, a traffic analysis platform, image recognition, a machine learning platform, a robotics platform, data farming, fraud prevention and a decision-making system.
 - **S series:** The Mobile Business Development Platform, the New-Generation Agent Pass, the Merchant Analysis Platform, the Cloud Sharing Platform, the Auto Insurance Billing System, BAOA, and the New-Generation Distributed e-Commerce Platform.
 - **H Series:** The Health Care Insurance Service Platform is able to directly pass healthcare invoices to insurers for automatic claims processing, arrange body examinations for policyholders, and assist insurers in managing risks. It also provide functions like medical data visualisation, customised insurance services, medical knowledge and fund insurance services.
 - **F Series:** The Small Consumer Loans System, the Installment Mall, the Fund-Asset Matching Platform, collection and payment, the Consumer Installment Loan System and the Virtual Credit Card System.

PingAn Technology

Products:

- **Channels:** Dr. An, VTM, Zhanyebao, mobile exhibition platform, channel alliance, PingAn Customer Service Cloud, cloud, hacker, contact cloud, XiaoAn robot.
- **Software:** CRM plug-in, Xingyun data platform, Euler map, PingAn Risk Control, Electronic invoice, Electronic signature, Investment cloud, Credit cloud, Sales cloud, Capital cloud, One-Pass Account System, Happy PingAn, Fingertip Office, Finance Expert, Zhiniao e-Learning, Enterprise cloud, Mario monitoring platform, Shenbing, Pingan Juyoucai and Kubaoyun.
- **Platforms:** Blockchain, PingAn Brain, Biometric Certification.
- **Infrastructure:** PingAn Cloud+.

PICC Financial Services

Internet insurance services, payment technology services, car services and inclusive finance services.

Products:

Source:<https://www.zhongan.io>/<http://tech.pingan.com>/<https://www.piccfs.com.cn/>

InsurTech: Infrastructure for New Insurance



Baoxianshi

Baoxianshi

Company profile

Baoxianshi is an insurance platform developed by Weiyi Technology. It was launched in May 2015, and 4 months later it had accumulated over a million users. It is committed to providing professional technical services and sales support to insurance companies, corporate insurance agents and individual insurance agents.

Business model

- Weiyi has built an online service platform that trains professional insurance consultants. Using big data, the system provides agents with accurate customer portraits for marketing purposes. It also provides policy interpretations so that agents can achieve better sales compliance.
- Baoxianshi aims at breaking down communication barriers and build a peer-to-peer experience-sharing platform. Indeed, the Peer-to-Peer module has become very popular with insurance agents, with tens of thousands of agents active every day.
- The platform features rewards to screen for high-value sales agents. Members can promote their membership levels and earn rewards by hitting premium goals, and extra rewards will be provided for maintaining such activity.

Products and services

- **Great display tools:** With the click of a button, agents can produce a detailed insurance plan that accurately demonstrates customer's interests.
- **Insurance product platform:** More than 300 popular products from over 50 insurance companies are offered online. With the click of a button, users can be billed electronically with no commission fee.
- **Daily industry news:** The platform offers news covering business development, insurance information and industry trends.
- **Online education:** The platform makes learning easier and encourages experience-sharing.
- **Professional training:** Star lecturers analyse insurance products and teach communication skills.
- **Insurance community:** Users can share work and life experiences with 7 million peers.

Source:<http://insurance.jrj.com.cn/2017/11/20083523452099.shtml>



i-Yunbao

Company profile

I-Yunbao is an Internet insurance product platform that was developed by Shanghai Leopard Cloud Network Information Service Company. The platform offers mobile insurance, convenient claims processing and an online settlement function. Also, customers can get discounts by sharing and participating in certain social media activities. The platform aims at providing effective and competitively-priced insurance products that are accompanied by convenient and efficient service.

Business model

- i-Yunbao operates an online platform where customers can browse and buy insurance products. Users can get commissions by advertising products for the company.
- Using the platform, the insurance agent sends the product to the user through a QR code. The platform then analyses the marketing data in real-time and the contract is processed online.
- The platform features six membership levels, V0 through V5. Members start at the lowest level and climb through the ranks as their activity on i-Yunbao increases (i.e. as they enter information, share links, invite friends, etc.). At the highest level, members can enjoy nine special rights and privileges.

Products and services

- **Premier training courses:** The platform teamed up with the China Insurance Champion Forum to provide quality insurance marketing courses to i-Yunbao's teachers.
- **Comprehensive product line and partners:** The platform has 18 insurance partners, covering medical insurance, critical illness insurance and life insurance.
- **Potential user tracking:** Relevant content can be quickly provided to potential users based on content that they have previously viewed.
- **Policy management:** Users can obtain customer policy reports with the click of a button. These reports are easy to understand; and if customers need assistance, they can access the customer service self-help programme

Source: https://mp.weixin.qq.com/s/Q7Rj3Z_MyZdFuCSGxTg0-Q



Tongdun

Company profile

Founded in 2013, Tongdun Technology is a third-party provider of big data risk control and anti-fraud services for enterprises in industries such as banking, insurance, and fund management. Tongdun has developed a range of core products for which it holds the intellectual property rights, and it strives to meet the various risk management needs of enterprises by supporting enterprise software and SaaS software.

Business model

- Tongdun focuses on risk control and data analysis applications, and has six major product lines that cover the areas of anti-fraud, credit risk management, insurance technology, overdue management, customer value digging and mobile security.
- Technology and algorithms are its core competencies. A unique global ID can be established for every device, allowing the company to analyse the operational behaviour of all users and produce device-based user portraits. Additionally, the company's applications can make judgments regarding personal risks in 200 seconds or less automatically.
- Tongdun's risk control cloud platform mainly provides credit risk solutions and fraud risk solutions, and it has accumulated more than 14 billion units of scenario data.

Products and services

- **Large number of customers:** At present, more than 7,000 corporate customers have purchased Tongdun's products and services, including more than 3,000 from the credit industry and more than 3,000 from the Internet industry.
- **High number of daily active platform users:** The average number of daily API activities exceeds 100 million, with a peak figure of over 200 million. The total number of platform activities has exceeded 35 billion, and the number of daily loan activities on the platform can reach up to 6 million.
- **Efficient and intelligent risk control:** Tongdun's intelligent risk control network can detect 1 million instances of fraud, which accounts for 62.5 percent of the total number of online scams in China (about 1.6 million).

Source: 2018 Global Insur-tech Report

2.3 Stability

Insurance technology is supporting the stable and safe operation of the insurance industry while also providing for innovation. IoT and AI applications have improved the overall capabilities of insurance companies by helping them obtain risk information, understand risks, and improve on the traditional management model, which relied only on risk probability. Similarly, new technology has ensured the security of transaction processes, which has reduced information asymmetry and results in better protection of customer information. In this way insurance companies, consumers and regulators can interact efficiently in a safe and stable system.

i. More comprehensive risk management

Insurtech provides the technical support needed for insurance companies to conduct more comprehensive risk management practices. By using various technologies, insurance companies can analyse and sift through large amounts of data and conduct risk control more effectively than ever before, helping to ensure the safe operation of insurance companies and the healthy development of the industry as a whole.

Insurtech has brought changes to insurance companies' risk management practices in two main areas:

Increased risk management tools: Through the use of innovative technological applications, insurance companies' risk management tools have become more diversified. For example, by using satellite image recognition technology, insurance companies can obtain more information for processes related to agricultural insurance and even bond market transactions in order to more comprehensively assess actual losses or business operations. Companies can then carry out the necessary procedures to control risks. In another example, using technologies such as on-board diagnostics (OBD), insurance companies can more accurately assess risk situations to prevent potential fraud risks during the auto insurance inspection process. Additionally, companies can use image recognition technology to verify the authenticity of invoices, documents and even customer identities, thereby reducing losses caused by fraud. This array of new technologies provides insurance companies with more

diversified tools for risk management, and allows them to better address different business scenarios and risk control needs and ultimately achieve more comprehensive risk control.

More convenient risk management: With the support of technologies such as the Internet of Things, blockchain, cloud computing, and big data, insurance inspectors can obtain comprehensive information without going to the accident site in person. Artificial intelligence can then conduct relevant security checks. In this way, these technologies can lower risks related to survey personnel, while also effectively reducing the costs and difficulties associated with risk management. For example, using satellite technology, drones and image recognition software, surveyors can assess damages in a severe disaster area remotely without going on-site, making management of the claims investigation process much easier. Additionally, insurance companies can use image analysis, knowledge mapping, and other technical analysis procedures to conduct remote online customer identification and carry out risk control operations such as information inquiries, fraudulent information comparisons, and risk contact information matching. The customer identification process only requires the customer to provide basic identity information, contact information and bank card information, and then a more comprehensive customer risk identification process can be performed. The application of technology has greatly reduced difficulties associated with risk management in specific scenarios in specific condition.

Improved risk management: Technologies such as big data and artificial intelligence have greatly improved risk management practices by enabling more effective analysis and processing of operational data. For example, insurers can use image recognition software to accurately process various types of customer invoices and policies, significantly reducing labour costs and increasing efficiency. Additionally, insurers can use data analysis technology in the claims process to effectively identify potential insurance fraud. New technological applications have expanded the coverage of insurance companies' risk monitoring practices and have made risk management and risk control measures faster and more effective, improving the risk management capabilities of the insurance industry as a whole.



Facial Recognition

Taikang

Technologies:

Cloud computing, big data and artificial intelligence.

Facial recognition technology can be used to quickly verify a customer's identity in all stages of the insurance process—insurance purchases, insurance confirmations, after-sales services, claims and other areas.

Product:

Taikang uses Baidu's facial recognition technology to verify customer identities online in order to sell insurance through WeChat, provide after-sales services, and to conduct insurance confirmations, return visits and other processes. In the buying phase, the application uses a body check to ensure that the buying process was actually completed by the applicant. Similarly, in the confirmation and return visit phases, the company uses online facial scanning to verify the customer's identity.

Product characteristics:

- **Facial recognition for identity verification:** Using facial recognition technology, users can verify their own identities online.
- **Excellent risk management:** Effective verification of customer identities can significantly reduce the fraud rates and effectively control risks.
- **Simple business process:** Taikang has replaced its manual verification processes with intelligent verifications enabled by its facial recognition system. In this way, the company has moved a large number of its insurance processes online while enhancing customer experience.
- **Build a complete customer experience loop:** Applying facial recognition technology throughout the entire insurance process provides customers with a complete experience loop. Going forward, Taikang will apply this facial recognition software to other sectors such as elderly care and healthcare in order to foster innovation.

Source: https://www.sohu.com/a/190725629_651994



Agricultural e-Insurance

China Pacific Insurance Company (CPIC)

Technologies:

Big data, artificial intelligence and the Internet of Things.

Agricultural e-insurance is based on the "Internet Plus" operation management system. Using mobile data terminals, the company's system can use drone photography, satellite remote sensing and other technologies to collect image data and geographic location information. Based on the collected data, back-office personnel can then decide whether to underwrite the property. In the claims stage, the same technology can be deployed to accurately and quickly assess damages. This system requires technological support from big data, the Internet of Things and artificial intelligence.

Product:

Agricultural e-insurance was co-developed by CPIC and the Chinese Academy of Agricultural Sciences. It constitutes an operation management system that consists of mobile data terminals, drone photography and satellite remote sensing. It is used to optimise agricultural insurance claims services and re-engineer business processes. At present, it has been successfully applied to aquaculture insurance and crop insurance.

Product characteristics:

- **Satellite and drone technology accurately locates and determines losses:** Agricultural insurance issues can be accurately and quickly investigated and assessed using improved data collection and computer technology capabilities.
- **Intelligent risk management:** The system monitors agricultural conditions in real-time to provide risk information, strengthen corporate risk management and control, and help farmers prepare for disasters and reduce losses.
- **Mobile business processes:** The underwriting and claims process for agricultural insurance can largely be conducted through mobile terminals.
- **Differentiated data service:** The system can handle large amounts of multi-dimensional data related to spatial locations, area sizes, aquacultural growth and other metrics to improve the accuracy of the claims process.

Source: <http://baijiahao.baidu.com/s?id=1578535398487787881&wfr=spider&for=pc>



Chexianfen Auto Insurance Scoring and Dingsunbao Loss Assessor

Ant Financial

Technologies:

Big data and artificial intelligence.

The Auto Insurance Scoring system applies big data and artificial intelligence technology to process massive amounts of people-related information, and assigns the users' different risk levels. The Loss Assessor uses AI to replace manual processes in the claims phase, and combines said AI capabilities with the cloud algorithm to examine accident photos and determine losses.

Product:

- **Chexianfen Auto Insurance Scoring:** This application uses artificial intelligence, data modelling and other technologies to analyse massive amounts of data. Through this analysis, it quantifies the risks of vehicle owners and assigns a score ranging from 300 to 700. The higher the score, the lower the risk.
- **Dingsunbao Loss Assessor:** This application uses deep learning image recognition technology and cloud algorithms to examine accident photos and efficiently and quickly determine losses. Dingsunbao's accuracy rate is about 98 percent, and it is expected to reduce the workload of loss adjusters by 50 percent.

Product characteristics:

- **Customer risk scoring:** Chexianfen quantifies risk by analysing massive amounts of data, assigning car owners an auto insurance score ranging from 300 to 700.
- **Automated loss adjustment:** Chexianfen accurately prices auto insurance based on owners' assigned scores. Dingsunbao uses AI technology to automate the auto insurance claims process, accurately assess damages and help the insurer make fair claims payments.
- **Efficient customer service:** Big data and artificial intelligence technologies can help insurance companies identify customer risks more accurately, set more reasonable prices, serve consumers more efficiently, and improve service experiences.

Source: <https://www.jfdaily.com/news/detail?id=57584>

ii. Safer transactions

Various innovative technologies have provided the insurance industry with safer transaction processes, which have effectively improved transaction efficiency while promoting innovation and development in the industry. Among these new technologies, blockchain's impact is particularly far-reaching. Blockchain technology is characterised by decentralisation, asymmetric encryption, trustworthiness, and time-stamping. Based on these technical attributes, blockchain databases cannot be tampered with and are difficult to break into. Data recorded in a blockchain is highly secure and reliable. Blockchain provides a straightforward and impartial verification mechanism based on network consensus, which ensures that the system neutral and reliable for all users. At the same time, blockchain's distributed ledger system ensures that data is stored securely and that damage to some data does not entail the loss of all data. These capabilities provide vital technical support for safer transaction processing in the insurance sector.

Technological applications have improved insurance transaction processing in the following ways:

Secure transaction information: Blockchain and other technologies can help ensure information security in insurance transactions. Each node on the blockchain holds a copy of all transaction information, which guarantees the integrity and authenticity of the account records and ensures that transaction information is correct. When the data in the blockchain and the number of participants reaches a very large scale, the cost of modifying information increases accordingly, requiring at least 51 percent of the computing power of the entire network to modify information. For this reason, the cost of modifying information would probably exceed any potential revenue that could be gained. Even when information in some nodes has been maliciously altered, other nodes in the blockchain quickly find these altered bits of information and correct them. Blockchain's unique characteristics can ensure information security in insurance transactions while also guaranteeing the authenticity of insurance policy information.

Reduced information asymmetry: Blockchain technology publishes transaction information to all computers in a network, forming a kind of decentralised database or "digital ledger." Each computer, or node, synchronises and verifies transaction information with other computers in the network. The chain's information can be traced backwards, which ensures the integrity of the information and allows transacting parties to make inquiries and confirm information, greatly

reducing information asymmetry risks in the transaction process. In the future, more and more data will be posted to blockchains. For instance, medical examination data can be posted to a blockchain for health insurance purposes; and information related to car purchases, accidents and claims can be posted on a blockchain for use by auto insurers. Developments such as these will significantly reduce fraud risks related to information symmetry while also improving insurance companies' overall operational efficiency and quality.

Strengthened customer information protection: Although the blockchain stores transaction information on each node throughout the entire network, the public and private key on each node only authorise the user to access transaction data when submitting an information inquiry. The personal information of all participants is confidential, which ensures that participants' information is not improperly disclosed, and also ensures that participants are not distracted by irrelevant information during the transaction process. This is of great significance to customer information protection in the insurance industry. In order to purchase insurance, customers must submit valid identity information and health or property information, which places high demands on the information protection capabilities of insurance companies, especially those that have online operations. However, due to a lack of information management and protection standards, many insurance companies currently face significant information disclosure risks. Blockchain's distributed identity verification system can effectively prevent information leakage while ensuring the authenticity of customer identities. The blockchain consensus mechanism mutually authenticates customer information on the blockchain, ensuring the security of online digital information. Used in conjunction with a security key, blockchain technology can significantly improve customer information protection.

Improved consumer experience: Blockchain technology provides the technical support necessary for new means of interaction between insurance companies and their customers. For example, due to blockchain's consensus feature, customers do not need to worry about losing their policy information since they can retrieve their purchase records from any computer in the network at any time. Capabilities like these will further improve consumer experience, while also promoting the development of the insurance industry and its overall image.

Re-insurance Blockchain

ZhongAn Insurance and reinsurers

Technologies:	Blockchain, big data and artificial intelligence. This technology enables point-to-point insurance transactions through the blockchain network. The re-insurance blockchain uses smart contracts to perform automatic account checking, so that the entire reinsurance process is conducted using blockchain technology.
Product:	The reinsurance blockchain features a decentralised approach that uses smart contracts to automatically check policy accounts and distributed accounting and full-node verification to conduct day-to-day re-insurance transactions. At present, this technology has mainly been applied for life treaty reinsurance, life facultative reinsurance, property treaty reinsurance and property facultative reinsurance.
Product characteristics:	<ul style="list-style-type: none"> • Blockchain distributed accounting: Blockchain data is characterised by its authenticity and irreversibility, which helps ensure the accuracy of transaction processes, reduce transaction costs, and alleviate insurance companies' trust concerns. • Highly intelligent processes: Data is entered in an automated and systematic manner, and transactions are highly standardised, resulting in simplified reinsurance transaction processes. • Highly secure transactions: Blockchain's traceability and tamper-resistant characteristics strengthen system transaction supervision and enhance transaction security.

Source: <http://baijiahao.baidu.com/s?id=1604597886735769422&wfr=spider&for=pc>

Blockchain-based Aviation Insurance on the Fizzy platform

AXA

Technologies:	Blockchain, big data and cloud computing. Fizzy's new insurance products use Ethereum's public blockchain to provide airline passengers with automatic flight delay compensation. The blockchain maintains the insurance contract records, which are accessible through smart contracts, and can trigger automatic payments.
Product:	Fizzy is a "100% automated, 100% secure" platform that provides parametric insurance for flight delays. When the necessary conditions are met, an automatic payment is sent directly to the policyholder's account.
Product characteristics:	<ul style="list-style-type: none"> • Automatic claims: When a flight is delayed for more than 2 hours, the smart contract function will automatically pay the claim amount to the customer. • Smart contracts: The smart contract function can determine whether the insurer should compensate the policyholder and trigger payment in the system.

Source: http://www.sohu.com/a/198262522_651743

2.4 Humanity

In the past, we spent large amounts of time learning how to use new technologies. With the development of new technologies such as artificial intelligence, machines have begun to adapt to human habits and meet the needs of human beings. In the technology-driven *new insurance* system, insurance companies can use technology to achieve more humanised interaction with customers and shift from an “after compensation” model to a “prevention and participation” model. To this end, insurers should aim to offer humanised products that enable them to work together with customers to reduce losses.

i. Humanised product design

Traditional insurance products are mainly concerned with economic compensation paid after damages occur. However, for the customer a core appeal is to mitigate risks and the probability of damages. The development of new technologies provides insurance companies with the opportunity to meet this core demand through insurance product design. For example, using data recorded by wearable devices, companies can design insurance products that feature health management measures to encourage customers to live healthier lifestyles. Insurers can also offer genetic testing services to help customers understand potential health risks, and companies can then create customised health maintenance programmes for these customers. In ways such as these, insurance companies can use innovative technologies to design products that are more humanised. These cutting-edge products are valuable in the following respects:

Using technology to lower risks: Insurance companies can use artificial intelligence and IoT technology to provide customers with risk prevention and risk management products. For example, by introducing health management measures into insurance products, insurers can combine after-the-fact compensation with preventative intervention to encourage customers to exercise and to foster customers’ awareness of safety risks. Similarly, insurers can also design innovative products that combine insurance with telematics or smart home technology. By changing the way in which customers experience, these products can better protect the health and property of customers and make risk management services more effective.

Innovate pricing and the virtuous circle: New technologies have enabled comprehensive and round-the-clock data monitoring, and have also significantly improved the availability and reliability of data. Effective data monitoring can provide support to various insurance products in terms of accurate pricing, innovative pricing, and in-depth risk management. For example, insurers can incorporate customer health data into their pricing tools in order to provide individualised pricing and fairer premiums to healthy people. At the same time, such a pricing mechanism encourages customers to make healthier decisions, and lead to the end of the vicious circle of “unhealthy people buy insurance – premiums rise – fewer healthy people buy insurance,” and the establishment of the virtuous circle of “insurance for everyone – effective customer health management – premiums fall.” Usage-based insurance (UBI) can be used in a similar way to price auto insurance products in a way that achieves better outcomes for customers and insurers alike.

Using real-life scenarios to provide comprehensive protection: Technologies such as the Internet of Things will provide insurance companies with the opportunity to embed products into the daily lives of consumers. The integration of critical illness insurance with wearable devices, property insurance with smart home technology, and auto insurance with UBI will all enable insurers to reach and interact with customers directly, and result in insurance products that are embedded into customers’ lives. Innovative products like these can become an important portal through which customers can obtain insurance services. When risks arise, the product can act as the customer’s risk management assistant and promptly address problems. In this way, insurance can be made more customer-oriented and achieve a more positive image in the mind of the consumer.



Genetic Testing and Gene Therapy: Tonganbao Children's Safety Insurance

ZhongAn Insurance

Technologies:	<p>Biotechnology.</p> <p>ZhongAn's Tonganbao Children's Safety Insurance is based on powerful genetic testing technology. Using genetic analysis, the Tonganbao system produces a genetic identification card for each child. The analysis results are represented by numbers that indicate gene characteristics, and each child is assigned a personal gene "tag," which is entered into the National Public Security DNA System. The genetic identification testing service is provided by ZhongAn Life, and the testing programme is completed by the national judicial appraisal agency.</p>
Product:	<p>Tonganbao Children's Safety Insurance aims to help lost children return home through the use of genetic technology and insurance. After purchasing this product, the consumer receives a missing child insurance policy and a genetic identification test. If the child goes missing in the future, Tonganbao provides compensation to parents to help them find and identify their missing child through DNA profiling.</p>
Product characteristics:	<ul style="list-style-type: none">• Safe and simple testing: The customer can receive the child's genetic ID card kit within 5 working days after the product is purchased. The customer only needs to swab the child's mouth, attach the label, and return it to ZhongAn Insurance within 24 hours. The customer can then check the genetic analysis results within 15 working days.• Accurate testing technology: Tonganbao provides a children's genetic ID card with 21 core Short Tandem Repeat (STR) DNA detection segments, which is 60 percent more than the international standard of 13. The combination of gene loci chosen is unique, and the test's fail rate is only one in a hundred billion tests.

Source:<http://news.cri.cn/gb/42071/2017/09/11/7371s5249031.htm>



Bububao Health Insurance

ZhongAn Insurance

Technologies:	<p>Big data and cloud computing.</p> <p>Bububao insurance uses mobile terminals, wearable devices, health apps, and other technologies to continuously monitor and collect large amounts of customer health data. Bububao then uses this data to provide personalised pricing.</p>
Product:	<p>Bububao insurance provides the first health management plan in China that collects exercise-related big data through the use of wearable technology. The system will recommend insured customers critical illness insurance with different prices and protection according to the customer's historical exercise record and expected goals. After they are insured, customers only need to achieve their daily exercise goals, which will allow them to get free insurance and other privileges.</p>
Product characteristics:	<ul style="list-style-type: none">• Innovative combination of insurance and exercise: Customers pay for insurance on their walking steps. When customers exercise more, they can pay less and receive better coverage.• Big data supports intelligent services: The insurer uses exercise data to measure customers' health risks in order to reduce information asymmetry and adverse selection.• More health management than insurance: Data shows that 42 percent of customers have increased their running days after buying Bububao insurance. When customers get close to their targets, it gives them more incentive to reach their exercise goals. As of June 2018, the number of Bububao customers exceeded 20 million.• Cooperation with leading smart device companies: Bububao insurance cooperates with more than 50 smart phone, smart device and sports health app companies such as Ali Health, Huawei Sports and Health, Mi Mobile, Meizu Mobile, and Lifesense Activity Tracker.

Source:<http://news.vobao.com/zhinan/jiankangxian/827664007942750188.shtml>

ii. More humanised customer services

Artificial intelligence, cloud computing and other technological applications offer significant advantages to insurance companies in the areas of product innovation and operational management. In an increasingly intelligent world, insurance companies' products and services are not only competing at the functional level, but also at the customer experience level. In recent years, Internet giants have used artificial intelligence to enhance the front-end service experience. In this way, they have made customer services more responsive to human needs, enabling customers to enjoy more natural and humanised interactions.

The in-depth application of artificial intelligence can change customer services in the insurance industry in the three following ways:

More natural interaction: In the artificial intelligence field, voice technology has been attracting large investments, and it has also been applied to customer service in significant ways. Compared to text interaction, voice interaction is more in line with the way that people naturally communicate, but it is also a bottleneck in the development of automated customer service. Artificial intelligence not only allows the computer to understand natural language and communicate more conveniently with humans—it also enables the machine to better imitate voices, intonations and expressions, enabling more humanised and natural interaction with customers. For example, Google Assistant, Google's AI-powered customer service tool, can make intelligent judgments based on users' basic information and "learn" six different sounds. The way it speaks is quite similar to the way that real people speak. This year's Google Developer Conference featured a demo in which Google Assistant called a restaurant based on a user request. During the phone call, Google Assistant made quick and correct judgments based on the information provided; and furthermore, it was difficult to determine whether it was a machine or a person talking. This kind of natural and convenient interaction is more in line with customers' real habits and needs, and serves as an important indicator of the direction that innovative service development will take in the future.

More personalised customer relationships: With the support of large-scale data, machine learning applications are able to learn and understand humans. Through continuous improvement of algorithms, technology can not only identify common features between different people but also identify characteristics that are more personal, thus allowing for a more personalised relationship with the user. For example, using communication records, insurers can draw knowledge maps for individual customers, and such maps can be improved as interaction with the customer continues, allowing for a more targeted and interactive service experience. Additionally, in terms of customer relationship maintenance, insurers can use customer preferences to provide products and services that meet customers' emotional needs in order to establish relationships that are more personal and humanised.

Better connection with customers' emotions: Emotional recognition, sentiment perception, natural language processing (NLP) and other technological applications can also improve customer service. At present, such technologies have already been partially applied in the area of customer service. Specifically, artificial intelligence can be used to analyse customer information in real-time. For example, during a phone call, AI applications can indicate to service personnel if a customer's mood changes based on content, voice, intonation and other factors, which can enable the service staff to take appropriate action to optimise the customer service experience. Additionally, customers often experience great emotional ups and downs when accidents happen. Insurers can use artificial intelligence to support rapid feedback and decision-making in the claims process in order to help soothe customers' emotions and generally improve the claims settlement experience.



State Farm

Technologies:

The Internet of Things, artificial intelligence and cloud computing.

State Farm cooperates with Hughes, a telematics manufacturer, to monitor driving behaviour using OBD equipment. First, IoT technology uploads the vehicle's driving information (mileage, fuel consumption, speed, etc.) to the server. Then, the company analyses and performs calculations related to various driving behaviours that the data demonstrates, and takes into account the relevant time period, road conditions and vehicle conditions. Based on this information, State Farm then uses big data and cloud computing technology to assess the driver's risk level and provide personalised insurance policies and prices according to its risk rating index.

Product:

Customers can log in to State Farm's website and download the mobile app for free, and then link their device to the company's Bluetooth beacon. After that, the customer's driving time, location, and style will be continuously transmitted to State Farm via Bluetooth and the mobile app. State Farm uses artificial intelligence and cloud computing technology to calculate insurance premiums individually for each driver who purchases the product.

Product characteristics:

- **Smart pricing:** State Farm uses big data to conduct accurate pricing and offer lower premiums to customers with good driving records.
- **Data centre:** State Farm's call centre is in direct contact with designated car repair organisations throughout the United States. It stores the entirety of customers' historical data and can calculate and analyse data on demand.
- **Positive feedback:** State Farm has launched its Steer Clear project, which provides a training course on driving skills for participating customers. After the course is completed, the customer will get a safe driving discount. If subsequently an accident occurs or unsafe driving behaviour is demonstrated, the discount will be reduced. In this way, customers are incentivised to drive more safely.
- **Usage-based insurance (UBI):** UBI technology can effectively reduce underwriting costs. After 3 years of UBI auto insurance reform, the company's loss ratio decreased by 6.4 percent, and its net profit compound annual growth rate (CAGR) reached 24.5 percent.

Source: http://iot.ofweek.com/2017-01/ART-132209-12006-30088064_3.html



ZhongAn Insurance

Technologies:

Artificial intelligence, cloud computing and big data. ZhongAn Elf is an intelligent insurance consultant that provides customised insurance solutions based on customers' risk assessment results, current situation and specific needs.

Product:

ZhongAn Elf can directly determine relevant issues based on the customer's verbal statements, and then provide an insurance plan according to the customer's specific life plan and needs. Customers can access the ZhongAn Elf by simply opening the ZhongAn app, clicking on the ZhongAn Elf icon, and giving a voice command. For example, the user can say, "I want to travel," and the ZhongAn Elf will promptly ask what the customer's desired destination is, and then analyse potential travel risks and recommend appropriate insurance products and services.

Product characteristics:

- **Intelligent product portfolio:** Supported by the company's large amount of insurance data, the ZhongAn Elf is able to provide customised and intelligent risk management solutions that are based on comprehensive analyses of customers' basic information, usage scenarios, claims information, and other data. Customers are also free to increase or decrease the insured amount and choose different insurance plans.
- **Voice interaction:** The Elf can recognise the customer's voice, identify relevant needs, and then provide an insurance plan based on the customer's life plan and wants.
- **1 minute family risk testing:** Customers can answer 9 questions in 1 minute, and the ZhongAn Elf will conduct a risk assessment and promptly provide a family risk report based on the responses.
- **Customised family insurance:** The ZhongAn Elf can provide a customised family insurance plan to customers.

Source:<http://invest.10jqka.com.cn/20180504/c604273332.shtml>



Lemonade

Technologies:

Artificial intelligence and big data. Lemonade provides landlord insurance and tenant insurance through mobile phones and websites. Instead of using insurance brokers, the company uses artificial intelligence and chatbots to simplify and streamline the online insurance purchasing process. Additionally, it uses big data technology to handle claims for customers through desktop and mobile terminals without the need for insurance brokers.

Product:

The company uses artificial intelligence and chatbots to quickly and accurately provide insurance products that suit customers' needs. With regard to underwriting, Lemonade screens insurance applications effectively by using AI technology and provides real-time quotes based on the collected data and information. Using artificial intelligence screening, the company can effectively reject certain high-risk applications and reduce its loss ratio.

Product characteristics:

- **Artificial intelligence in underwriting and claims:** Customers can get insured by talking with Maya, the company's robot. Additionally, during the claims process customers can get help from Jim, the claims chatbot, and upload photos, videos and other evidence through Lemonade's mobile app.
- **Precise pricing:** The company offers different rates to different policyholders based on data such as the person's residential location, credit report data, claims history, and mobile app data.
- **High claims efficiency:** The company's artificial intelligence technology independently handles a quarter of all claims without the need for manual input. For most small and simple claims, the process and payment can be completed in 3 seconds.

Source:<http://www.weiyangx.com/272847.html>

2.5 Regulations:

Driven by the technological revolution, the structure of the insurance market is constantly evolving, insurance products and business lines are becoming more diverse, and services are becoming more extensive. All of these factors are having a significant influence on the economy and society as a whole. Along with these developments, operational processes in the insurance industry are becoming more complicated, and the types and quantities of business data have increased sharply, making supervision more difficult. These changes have introduced numerous challenges to regulatory efforts as well as to risk management and control within the insurance companies themselves. In this new era, regulatory technology should aim at satisfying relevant regulatory needs, improve regulatory efficiency, reduce regulatory costs, maintain financial stability, and promote cross-border cooperation. In line with these goals, new developments in regulatory technology are mainly being applied in two areas: industry regulation and corporate compliance.

i. Industry regulation

The integration of regulatory efforts with technologies such as cloud computing, big data, artificial intelligence and blockchain has helped build a new regulatory system that is more comprehensive, dynamic, efficient, intelligent and low-cost. This new system is able to respond to the regulatory needs of new finance, new insurance, and other parts of the new economy. In this way, it can help promote global regulatory cooperation, maintain financial stability, and ensure healthy and sustainable financial development.

New technological developments and applications have enhanced regulatory efforts in the following respects:

Comprehensiveness: With the continuous improvement of technological applications, the insurance industry is steadily becoming more digitalised, and data integrity has been strengthening as well. Technologies such as blockchain have reinforced data continuity, consistency and traceability, providing more reliable and convenient resource support for regulators. Meanwhile, the data analysis and processing capabilities of big data, artificial intelligence and other technologies have improved risk and exception identification capabilities and have allowed for more comprehensive regulation. Improvements in capabilities related to regulatory comprehensiveness feature three characteristics. The first characteristic is all-inclusiveness. Data that is multi-dimensional, from more extensive sources and from a longer timeframe enables regulators to adopt a broader, more global perspective. With financial products and services becoming more complex and financial risks becoming more concealed and contagious, cross-regional, cross-cycle and cross-platform risks can accumulate, transmit and breakout more rapidly and destructively than in the past. For this reason, the expansion of the scope of regulatory monitoring enabled by technology is of great significance to overall risk supervision. The second characteristic is continuity. The establishment of a continuous risk supervision system will help regulators to discover risks at the source and take appropriate measures to remedy them and, where necessary, hand out punishment. Such a system will also be able to constantly monitor the effectiveness of remedial measures in order to improve the overall effectiveness of regulation. The third characteristic is its penetrating nature. As technologies and innovations become more integrated, risks will often be over-laid and concealed. In this new era, traditional regulatory methods may not be effective in identifying such risks and tracing them to their sources, which could lead to risks spreading or breaking out. Fortunately, new technologies are able to more deeply mine and analyse large amounts of data, thereby controlling and preventing risks more effectively and improving overall regulatory effectiveness.

Dynamism: The financial industry is constantly changing. Boosted by new technology, the market is currently growing at a particularly rapid pace. The current market is characterised by continuous high-speed operations. In this environment, traditional regulatory measures face challenges in keeping track of market operations, tracing market changes, uncovering illegal market behaviour and preventing risks. New technologies have enabled market regulation and supervision that is dynamic, continuous and effective. In this way, these technologies have significantly enhanced the stability of market operations.

Effectiveness: With the support of regulatory technology, regulatory efficiency has been substantially improved, mainly in two respects. First, supervisory efficiency has been greatly improved. With the computing resources, data capabilities and processing capacity provided by regulatory technology, regulators have been able to achieve market supervision that is comprehensive, dynamic and effective. In this new era, market supervision is more sensitive and can detect violations and potential risks in a more timely manner. Second, regulatory effectiveness has been greatly improved. Innovative technology has allowed regulators to trace and evaluate the effects of regulatory measures in a continuous, dynamic and penetrative manner. This development has enhanced the effectiveness of regulatory measures, helped ensure the authority of regulations, and improved overall regulatory efficiency.

Intelligence: With the continuous development of regulatory technology, digital regulations that are technology-based are expected to play a more effective role. In the future, regulatory authorities might even transform into data management organisations. By harnessing science and intelligent technology, regulators can achieve comprehensive, dynamic and efficient supervision over the entire market. This kind of market supervision will feature various intelligent measures such as intelligent risk identification, smart and automated regulatory measure applications, and intelligent tracking of monitoring results.

Low costs: New technologies provide efficient and low-cost risk identification and supervisory solutions for the regulation of various long tail enterprises. Technologies such as cloud computing, big data, artificial intelligence, and blockchain have substantially reduced the costs of data acquisition, maintenance, analysis and processing; and they require less manpower. Overall, these new technologies improve processing efficiency, enhance the effectiveness of supervision and regulations, and reduce regulatory blind spots and loopholes, thereby effectively controlling regulatory costs.



Fintech Regulatory Sandboxes

The UK Financial Conduct Authority (FCA) and the US Consumer Financial Protection Bureau (CFPB)

Background:

“Sandbox” was originally a computer term that referred to a testing environment for programmes that are potentially untrustworthy or destructive, or that have unknown intentions. Tests performed in the sandbox are mostly carried out in a real data environment, but there are preset security measures that ensure the tested programme will not affect the host system and its data.

The concept of a Regulatory Sandbox was first proposed by the British government in March 2015. After submitting an application and receiving authorisation, innovative financial companies are allowed to test products and services within the scope of the sandbox, which features safeguards for customers and other restrictions. The FCA monitors the testing process and then determines whether regulatory approval will be granted, and whether the product or service may be promoted outside the sandbox.

Impacts:

In October 2017, the FCA issued a progress report on the implementation of its Regulatory Sandbox policy. The report showed that since the application process opened in June 2016, the FCA had received 146 sandbox applications. Out of this total, 50 applications were accepted and 41 entities conducted testing. The report also outlined the overall impact of the sandbox on the market, and included information about the adoption of new technologies, increased consumer access, and the improved experiences of disadvantaged consumers. The report concluded that the benefits of the sandbox included reducing the time and costs associated with introducing innovative ideas to the market. In May 2018, the US Consumer Financial Protection Agency (CFPB) announced that it was working with the US Commodity Futures Trading Commission (CFTC) to develop the US’s first fintech regulatory sandbox.

Source: The origin of the case: <https://finance.ifeng.com/wemoney/special/wemoneyzlygjsghdzjrkjgdjjjzfx>



Online Electronic Audit Services

Confirmation.com

Introduction:

Confirmation.com is a one-stop provider of auditing letter solutions. It is a secure online platform that provides confirmation letter services to auditors and accounting firms. It uses both digital and traditional correspondence methods to perform a range of audit confirmation letter requests, including those related to accounts receivable, accounts payable, bank accounts, employee benefit plans and legal issues.

Currently, Confirmation.com provides audit services to more than 16,000 audit firms, 125,000 auditors and 850,000 auditees in more than 160 countries around the world. It is a leading regulatory technology start-up in the US’s audit industry.



Regional Financial Security Big Data Regulatory Platform

Tencent

Introduction:

At the end of 2017, Tencent signed a series of cooperation agreements with the Beijing Municipal Bureau of Finance and the Shenzhen Municipal Government Financial Services Office to build a regional financial security big data regulatory platform. This platform aims to identify and monitor various financial risks, protect the legitimate rights and interests of financial consumers, and support local financial regulators in their efforts to prevent and control financial risks. It will apply a variety of methods using multi-dimensional financial data, model regression, fraud signs, and regulatory process management models. The platform was built using the Lingkun Financial Security System, which was developed by the Tencent Security Anti-fraud Laboratory. The Lingkun System is designed to prevent and control fraud, particularly illegal activities in the inclusive finance sector. In addition to the AI technologies provided by Tencent’s Anti-fraud Laboratory, WeChat, QQ and Tencent’s security products have also provided a strong basis for the platform through the big data they have accumulated over the years.

Source: The origin of the case: <https://www.confirmation.com/>

ii. Company compliance

Regulatory technology, or regtech, can help regulated institutions of all kinds meet their compliance requirements through the use of technology. Specifically, regtech can help companies use artificial intelligence, blockchain and other technologies to better meet the challenges posed by regulatory monitoring, company reporting, company compliance and risk management. Additionally, by improving internal compliance procedures, regtech can help companies improve compliance responses and reduce compliance costs.

Improved compliance procedure design: In the current financial industry and particularly in the insurance sector, manual operations still account for a large part of internal compliance management workloads. Compliance procedures are not yet technology-driven enough. Additionally, the management and application of compliance data are still at a relatively low level. Manual regulatory and compliance procedures greatly reduce the reliability and effectiveness of companies' internal compliance and regulatory responses. Regtech can provide an effective solution to these issues and significantly improve compliance processes. Companies can use cloud computing, big data, artificial intelligence, blockchain, and other technologies to comprehensively manage and analyse large amounts of data and establish an internal compliance management system that is agile, digitalised and intelligent. Such a system can effectively identify potential problems related to issues such as illegal operations and high-risk transactions. It can also improve the accuracy and effectiveness of risk identification, reduce the time needed to address compliance risk events, and decrease risk exposure caused by manual operations. Finally, an intelligent system can take preventative measures to avoid penalties caused by failing to meet regulatory requirements, and can prevent such failures from leading to greater operational risks.

Improved compliance responses: In the current market, changes in products, services and competition have increased the ways in which the industry needs to be supervised and monitored. Regulatory requirements with regard to compliance responses are significantly different than in the past. Regulatory responses are also required to higher quality and faster. Using new technologies, companies can establish internal compliance response processes that are technology-driven. For example, companies can verify data tracing with the help of blockchain and other technologies. Additionally, companies can use big data and artificial intelligence technology to implement comprehensive data management processes and conduct data mining. These technologies can enable insurers to decouple and combine various types of sophisticated data, efficiently and quickly generate regulatory response reports, and enact regulatory requirements in a timely manner. In this way, insurance companies can use technology to improve compliance controls and quickly implement compliance responses that are complete, comprehensive and accurate.

Reduced compliance costs: Constantly changing regulatory conditions are presenting significant challenges to insurance companies. Increases in the number of regulatory reports and compliance categories are requiring companies to develop and deploy more tools, collect more data, and use various new analytical tools. Regtech can provide professional and flexible solutions that satisfy regulatory requirements in an efficient and cost-effective way and address these challenges. For example, companies can use big data technology to establish a regulatory data system and dynamically maintain it. Additionally, insurers can use artificial intelligence to more effectively mine and analyse data sets in new ways. In this way, insurance companies can make more efficient use of resources and eliminate redundant work and system maintenance costs.



The Shanghai Insurance Exchange (SHIE)

The Insurance Exchange Chain

Technologies:

Cloud computing and blockchain.

The Insurance Exchange Chain features four service systems. The identity authentication system provides for the authentication, auditing, issuance and management of identity certificates. The consensus service system ensures the consistency of distributed data. The smart contract service system allows the user to install and upgrade smart contracts. Finally, the platform service system implements dynamic networking, and configuration management and access strategy management for the multiple blockchains on the underlying platform.

Product:

The blockchain technology underlying the Insurance Exchange Chain features an identity certification service system and provides audit-specific certificate services to meet the regulatory audit requirements. It also provides special certificates that meet regulatory standards for business transaction audits. The Regulatory Certificate Authority Configuration Module provides tools for meeting regulatory standards related to various auditing and compliance requirements.

Product characteristics:

- The Insurance Exchange Chain adopts the proprietary Golang algorithm package independently developed by the Shanghai Stock Exchange, and supports cryptographic algorithms that meet the security requirements of international businesses. The Chain features strong concurrent processing capabilities and can support data uploads of up to 50,000 policy fingerprints per second.
- The platform's technology provides two deployment modes—local deployment and cloud platform hosting deployment—to suit the needs of different enterprises. In this way, the Chain shortens the deployment cycle, reduces development costs, and facilitates quick access for different types of organisations.
- The Chain provides a convenient and efficient application development interface. This interface meets the needs of developers in application development, system management and system operation and maintenance through a unified development package that integrates interface services and functions. It supports agile development and rapid iteration of business scenarios.
- The Chain provides a Regulatory Certificate Authority Configuration Module that meets regulatory audit requirements and business compliance requirements.
- The Chain's performance is reliable; and its configuration parameter and efficient applications can reach the performance requirements of enterprise-level applications.
- The Chain's monitoring system monitors transactions, the network, CPU memory and storage in real-time and closely monitors the health of the blockchain network. Additionally, the monitoring system features real-time early warnings at the system layer and the application layer.
- The Chain features a multi-chain architecture. The underlying architecture effectively balances system performance, security, reliability and scalability. It introduces the "channel" concept, implements data isolation and access control for different services, and provides useful smart contract templates. Additionally, the pass-through chain supports one-level deployment of multi-chain operations.

Source:<http://baijiahao.baidu.com/s?id=1597701093266959527&wfr=spider&for=pc>



PingAn's Innovative Financial Auditing Model

PingAn

Introduction:

PingAn has established a life cycle management system based on data flows to enable model establishment, testing, deployment, operating, management and termination. This system detected more than 40 percent of problems found in the entire audit process. At the same time, the company also optimised the Internet financial audit model and adapted innovative audit technology for the company's Internet business. The company's model prevents moral hazard and inappropriate investments by employees through employee/third-party conflict of interest management measures and an effective control system. In addition, the company comprehensively upgraded its monitoring management system and case prevention measures, and constructed a series of management tools to improve response speed and capabilities. PingAn has also continuously improved the construction of its off-site inspection system, project implementation platform, quality management and assessment, management application system, knowledge base and model platform.

Source:The origin of the case:<http://insurance.jrj.com.cn/2016/01/23080320470001.shtml>

04

New Discoveries: Insights on the Current State of Insurtech



1. The Background of Interviewees

In order to better understand the views of industry insiders regarding the current state and future prospects of insurtech, we interviewed and surveyed approximately 200 industry professionals. These people hailed from various industry institutions, including traditional insurance companies, Internet insurance companies, Internet companies, technology companies, and university research institutions. Please refer to Figure 4-1 for a distribution of industry institutions from which the interviewees came. The departments from which the interviewees came included marketing departments, actuarial departments, product departments, financial departments, investment departments, and underwriting and claims departments. Please refer to Figure 4-2 for a distribution of the departments from which the interviewees came.

Figure 4-1: Industry institutions from which the interviewees came

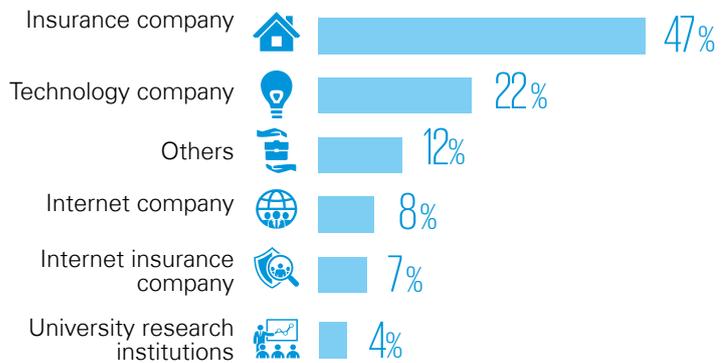
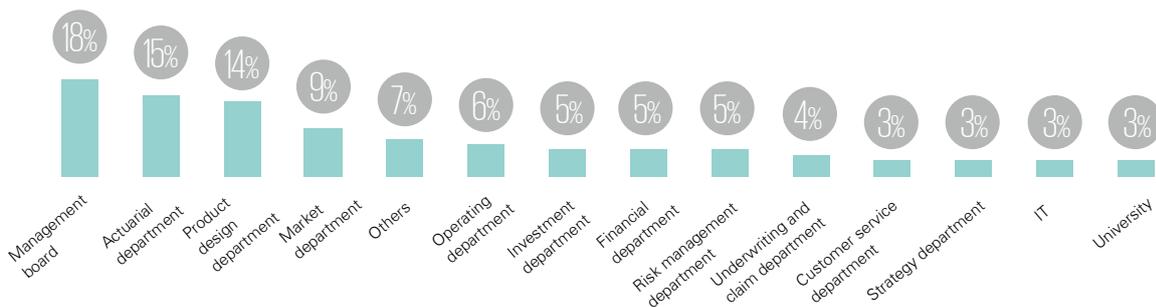


Figure 4-2: Departments from which the interviewees came



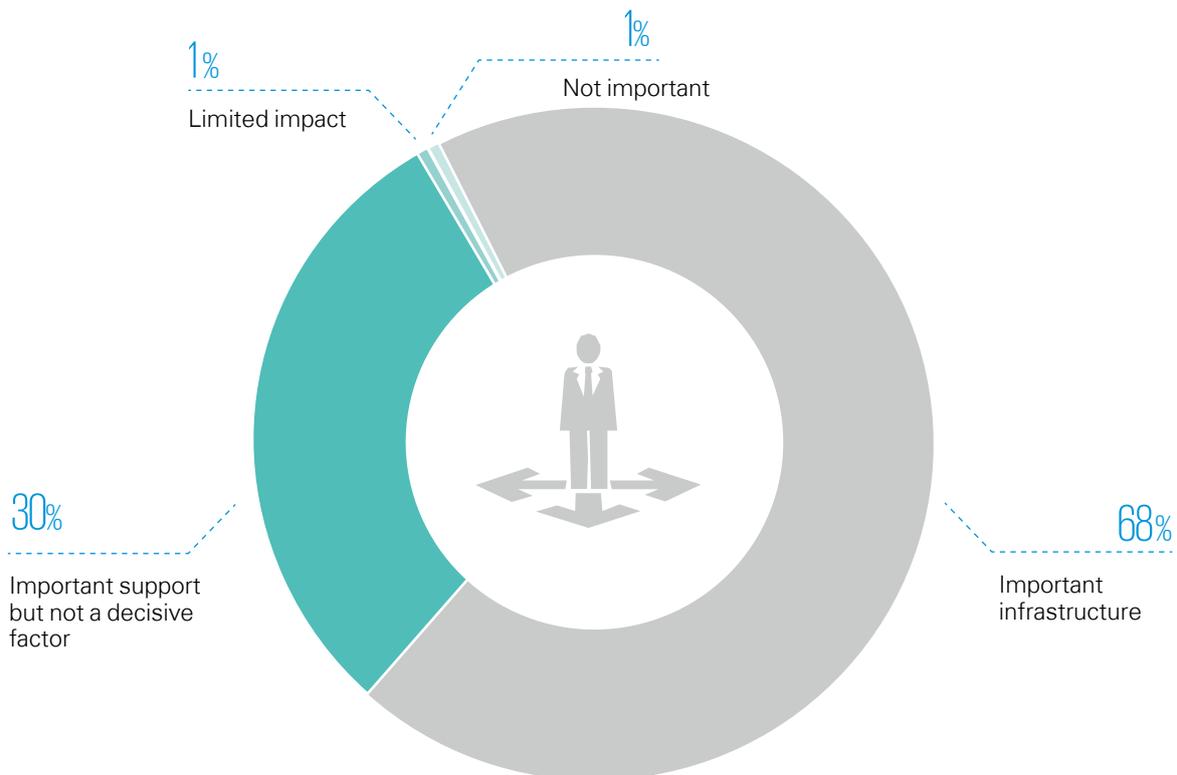


2.The Direction of Insurtech Development

► Science and technology are important to the future development of the insurance industry

The survey shows that, despite being from different industry institutions and departments, almost all interviewees believe that insurtech offers important infrastructure or support for the future development of the insurance industry. Among interviewees, 68 percent believe that insurtech offers important infrastructure for the future development of the industry; and 30 percent of interviewees, mainly those from traditional insurance companies, believe that insurtech offers important support but is not a decisive factor for future development. Only 2 percent of respondents indicated that insurtech had little impact or importance (see Figure 4-3).

Figure 4-3: The role insurtech will play in the future development of the insurance industry



► **70 percent of interviewees believe that insurtech will have a great impact on the insurance industry in 5 years**

The survey found that 44 percent of interviewees think that insurtech will bring significant changes to insurance companies in the next 3 to 5 years, while 26 percent believe that such changes will come in 1 to 3 years. On the other hand, 21 percent of interviewees believe that such changes will take at least 5 to 10 years, and 4 percent think that at least 10 years will be needed for insurtech to bring big changes to the insurance industry. Please refer to Figure 4-4 for a breakdown.

This research also showed us that interviewees from traditional insurance companies are less optimistic about insurtech. Only 10 percent of these respondents think that 1 to 3 years will be enough time for insurtech to bring significant changes. However, interviewees from technology companies, Internet companies, and Internet insurance companies were more optimistic. The survey found that 41 percent of respondents from these companies believe that technology investment will bring about tremendous changes in 1 to 3 years. This disparity in views toward insurtech reflects the cultural differences that exist between traditional and non-traditional companies and the markets in which they operate.

Figure 4-4: Opinions regarding the number of years it will take for insurtech to bring great changes to insurance companies

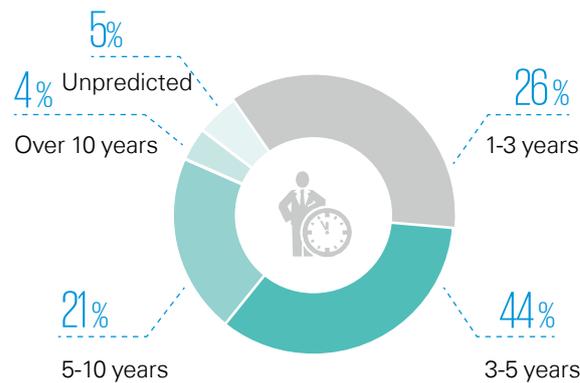


Figure 4-5: Opinions from traditional insurance companies regarding the number of years it will take for insurtech to bring great changes to insurance companies

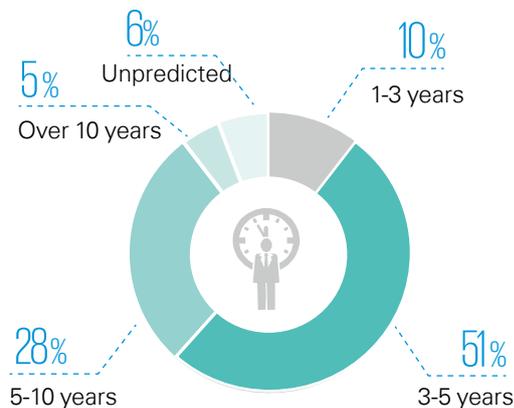
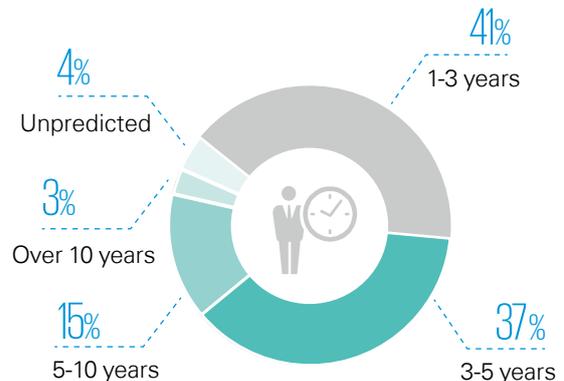


Figure 4-6: Opinions from non-traditional companies regarding the number of years it will take for insurtech to bring great changes to insurance companies



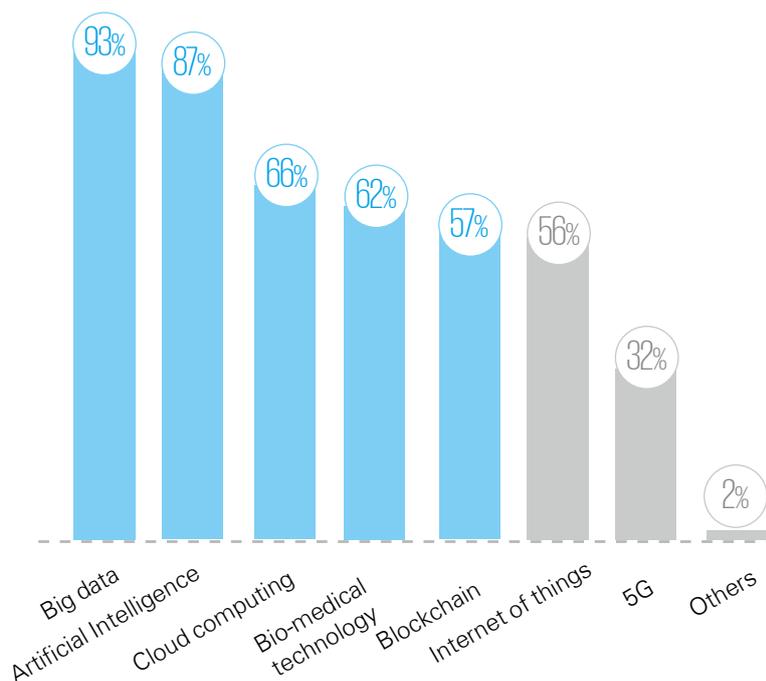


3. The types of technology that will have the biggest impact on the insurance industry

► Big data and artificial intelligence will have the most significant impact on the future development of the insurance industry

The survey found that 93 percent and 87 percent of interviewees respectively believe that big data and artificial intelligence will have a great impact on the future development of the insurance industry. Additionally, more than half of interviewees indicated that cloud computing, biomedical technology, blockchain, and the Internet of Things will have a great impact. However, compared to other technologies, the number of interviewees who think that 5G will have a big impact was relatively small (see Figure 4-7). These survey results are consistent with the current direction of technology applications. Big data—one of the earliest technologies to be adopted by the insurance industry—and artificial intelligence have been applied so widely in the industry that they have affected almost every business process. Artificial intelligence in particular is beginning to flourish and is creating a great imagination space for technology-oriented development in the industry. Nearly 90 percent of interviewees regard it as the second most impactful technology affecting the industry.

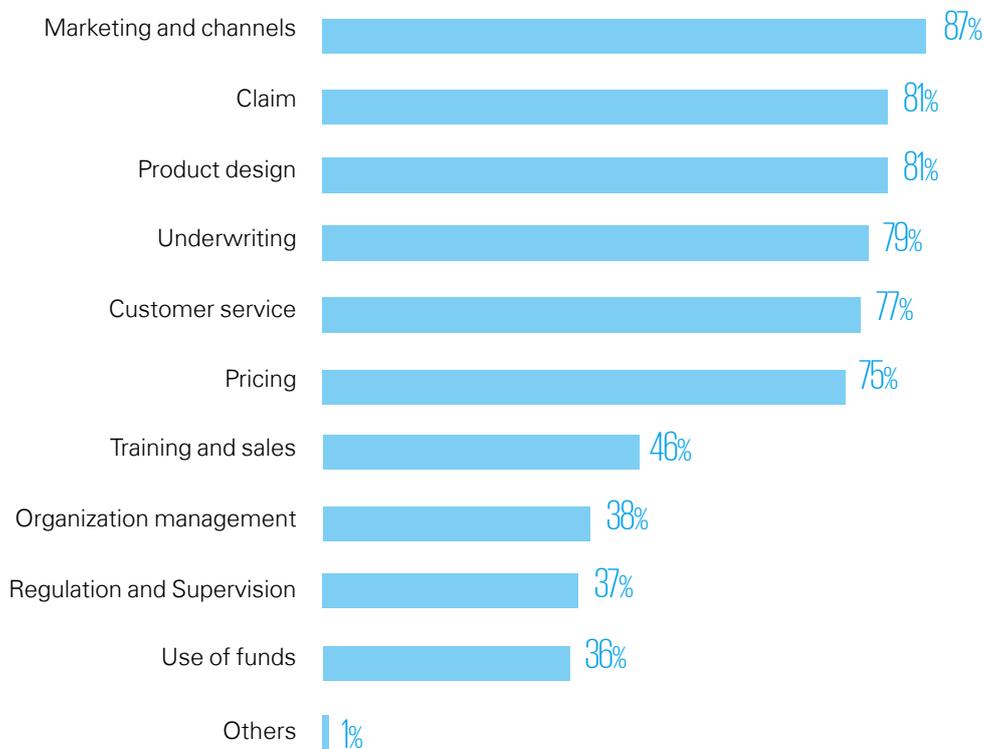
Figure 4-7: Insurance technologies that will have the biggest impact on the future development of the insurance industry



► All core business processes are impacted by insurtech

In terms of industry processes, interviewees generally indicated that all value chain processes would be changed by technology to various degrees. Specifically, 87 percent said marketing and channels would be impacted, 81 percent said the claims process would be impacted, 81 percent said the product design process would be impacted, 79 percent said the underwriting process would be impacted, 77 percent said the customer service process would be impacted, and 75 percent said the pricing process would be impacted. These results are fairly consistent with current technology utilisation levels in the insurance industry. Please refer to Figure 4-8 for a graphical breakdown of these statistics.

Figure 4-8: The impact of insurtech on insurance business processes







4. The industry's current status and future direction

► Current investments in insurtech are less than what the industry needs

The survey found that 64 percent of interviewees believe that current investments in insurtech are less than what the insurance industry needs (see Figure 4-9). These detailed results show that traditional insurance companies have more urgent demands for insurtech investment than other companies do. Specifically, 72 percent of respondents from traditional companies believe that current investments in insurtech are less than what the insurance industry needs, and no individuals from traditional companies think that current investments exceed what the industry needs. On the other hand, the survey found that 57 percent of interviewees from non-traditional institutions—represented by technology companies, Internet companies and Internet insurance companies—believe that current investments are less than what the insurance industry needs. Interestingly, 22 percent of respondents from this group believe that current investments exceed what the industry needs. Based on these results, it is clear that the traditional and non-traditional sides of the industry perceive investment levels quite differently. The reason for this difference may be that traditional insurance companies tend to under-invest in technology, and technology and Internet companies do not have a deep understanding of the insurance industry.

Figure 4-9: Opinions regarding the adequacy of current technology investments in the insurance industry

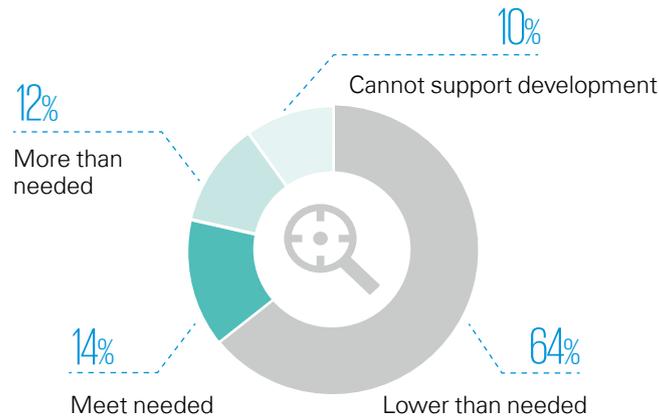


Figure 4-10: Opinions from traditional companies regarding the adequacy of current technology investments in the insurance industry

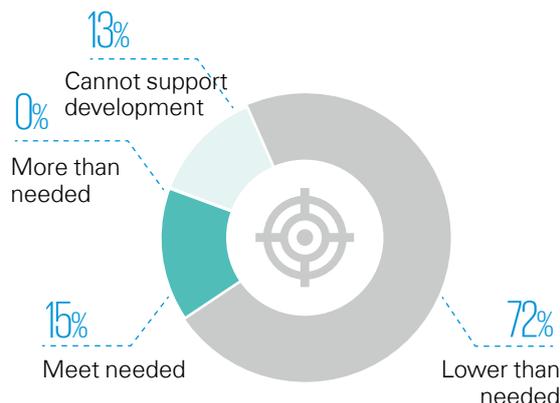
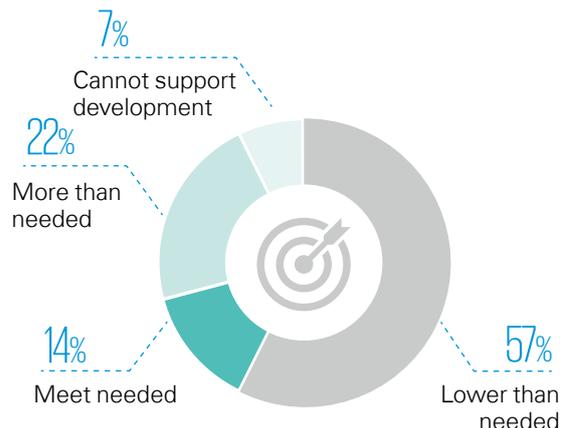


Figure 4-11: Opinions from non-traditional companies regarding the adequacy of current technology investments in the insurance industry



► Investments in insurtech should be increased in the future

With regard to insurtech investment in the future, the majority of interviewees (89 percent) believe that insurtech investments should be increased (see Figure 4-12). This opinion is widely held by both traditional insurance companies and non-traditional institutions. Although the survey showed that 22 percent of interviewees from technology companies, Internet companies and Internet insurance companies believe that the industry has currently invested too much in technologies, only 3 percent of interviewees from such companies believe that technological investments should be reduced in the future.

Figure 4-12: Opinions regarding the future of technology investments in the insurance industry

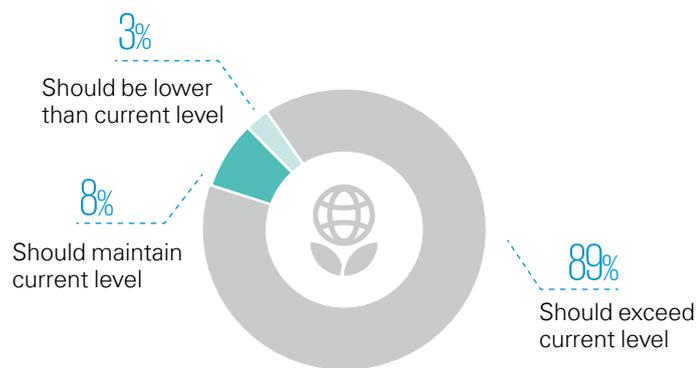


Figure 4-13: Opinions from traditional insurance companies regarding the future of technology investments in the insurance industry

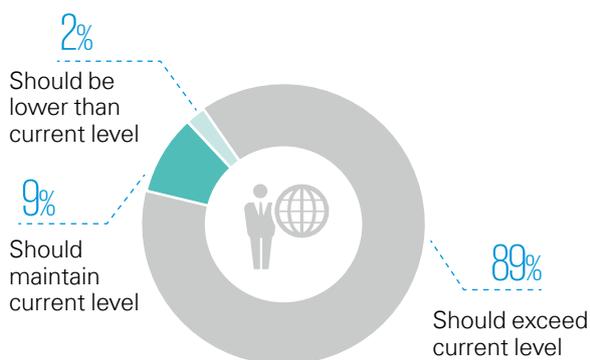
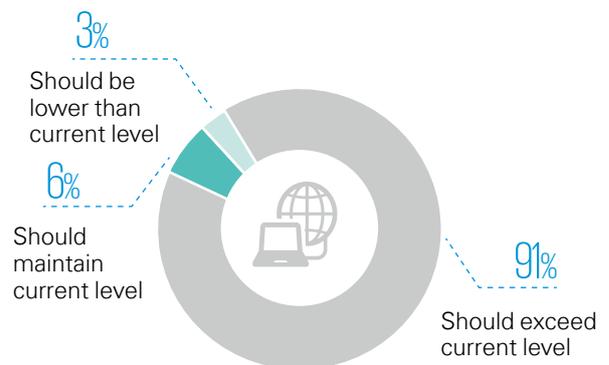


Figure 4-14: Opinions from non-traditional companies regarding the future of technology investments in the insurance industry



► Insurtech development should make full use of internal and external resources

With regard to establishing insurtech advantages, 82 percent of interviewees believe that insurtech should mainly be sourced through independent R&D and external procurement. The survey found that 10 percent of interviewees believe that insurtech advantages can be established solely through independent R&D. The remaining 8 percent believe that insurtech advantages can be established entirely through external procurement (see Figure 4-15). Among traditional insurance companies, only 1 percent of interviewees believe that they can rely entirely on independent R&D. On the other hand, 19 percent of interviewees from technology companies, Internet companies and Internet insurance companies believe that insurtech advantages can be established entirely through independent R&D, as they are more confident in their own R&D capabilities.

Figure 4-15: Opinions regarding insurtech sources

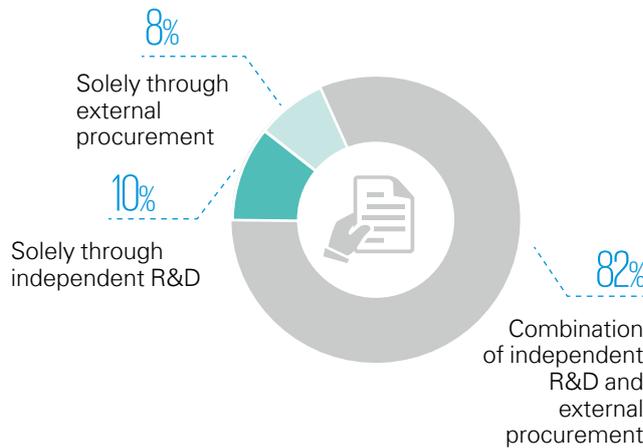


Figure 4-16: Opinions from traditional insurance companies regarding insurtech sources

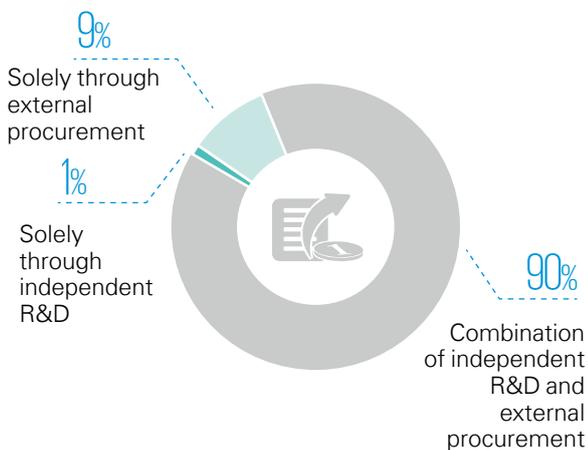
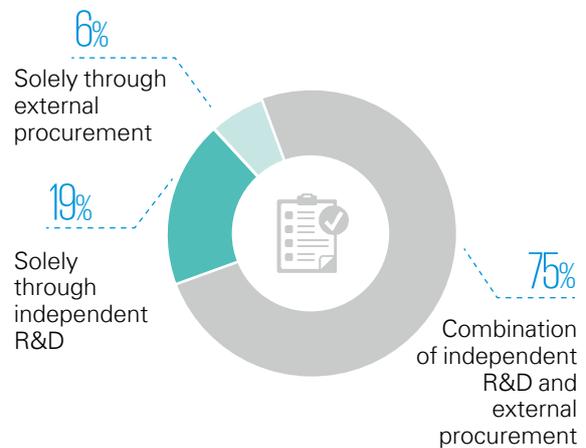


Figure 4-17: Opinions from non-traditional companies regarding insurtech sources





5. Insights on the current state of Insurtech

We held in-depth discussions on the impact of insurtech on the future of the insurance industry with a number of corporate executives, industry experts and research scholars who participated in the questionnaire survey. Below we have summarised their main points:

► The insurance industry currently faces both opportunities and challenges.

- With regard to opportunities, respondents generally believe that continued economic growth will bring about a larger consumer base, which will of course be good for insurance companies. Additionally, the insurance coverage gap is huge, and insurance penetration and density is still low. Structural changes brought about by economic and social developments in the New Normal era have also generated growth opportunities for the insurance industry, such as in the areas of consumer finance in property insurance and pension and health needs in life insurance. Additionally, the government had recognized and supported insurance industry's role in achieving social security which had been elevated to the national strategic level.
- Respondents believe that challenges mainly stem from the external environment, such as international and domestic macroeconomic factors and uncertainties in financial markets. At the same time, the application of new technologies such as autonomous driving and genetic testing has also brought about challenges for business models, product pricing and risk management. Finally, traditional insurance companies are facing inter-industry competition as Internet companies, technology companies and other enterprises enter the insurance market.

► Insurtech will enhance the industry's value chain and likely produce changes to business models.

- Respondents generally believe that insurtech will improve the efficiency of insurance companies and reduce their operating costs. Meanwhile, insurtech will help companies accurately locate customers, enrich consumer scenarios, and provide more personalised services. Insurtech will also play an important role in preventing and controlling business risks and improving risk management capabilities.
- Some respondents believe that insurtech could reconstruct the ecological structure of the insurance industry. For instance, some believe that the popularity of autonomous driving technology may lead to auto insurance being replaced by product liability insurance, and the development of cancer detection technology could reshape health insurance terms and rates. However, interviewees said that combining technology with core business lines such as actuarial work and underwriting will take time. For that reason, they believe that in the early stages, insurtech should be applied gradually, with more innovations being carried out as data is accumulated.

► Insurance companies should embrace the challenges and opportunities brought by technology

While insurtech will make operations more convenient for insurance companies, it will also present challenges for the insurance industry's main business lines. Respondents believe that insurance companies need to be truly customer-centric and adapt their business processes and organisational structures in a timely manner in order to respond to the rapidly-changing external environment and customer needs. Specifically, insurance companies need to increase investments in their science and technology teams in order to attract and accumulate top talent. Some respondents suggested that an independent innovation department could be established initially without affecting the existing company structure, and that its research results could be piloted and promoted in relevant departments. In addition, respondents generally believe that insurance companies need to strengthen employee training to improve their acceptance, understanding and application of new technologies and processes.

► In the era of science and technology, different types of companies need to develop their own methods and solutions.

• Insurance and technology should complement each other:

Technology companies need to focus on upgrading their technology so that they can provide better services to insurance companies, and insurance companies need to explore new business models and focus on using insurtech to improve efficiency.

• The digital transformation of property insurance will be different from that of life insurance:

Respondents also believe that life insurance companies and property insurance companies will apply insurtech in significantly different ways.

- Data collection in the property insurance field is relatively easy since the relevant data is highly quantifiable and can be grouped based on specific criteria. Additionally, the protection period for most property insurance products is less than one year, which makes risk management and digital transformation measures easier to implement.
- On the other hand, life insurance policies are more complicated and need to be explained face to face. Current human-computer interaction technology cannot meet the needs of interactive products. Technology should be applied to different scenarios depending on the customer group. For instance, companies should focus on promoting certain products to younger customers and implement a more flexible product mix and pricing strategy for middle-aged customers. Additionally, due to the longer protection period of life insurance and health insurance, risks and claims can occur after decades, which makes pricing more complicated and innovation riskier. For these reasons, life insurance companies should focus on detecting potential risks, accumulating data, and using Internet technology to develop life insurance products that are more suitable for consumers. At the same time, companies should closely monitor national pension and medical policy reform to uncover win-win opportunities related to these sectors.

► Insurance companies need to optimise internal decision-making to better support the use of insurtech.

In the survey, respondents proposed various paths and theories for how insurance companies should apply insurtech, but some respondents voiced concerns about whether insurance companies' internal decision-making mechanisms could effectively support the

use of insurtech. For example, a domestic respondent said that due to traditional insurance companies' large and complicated organisational structure, their internal decision-making mechanism is the main factor affecting the application of cutting-edge technology. This interviewee indicated that traditional insurance companies' cautious approach towards the introduction and use of cutting-edge technology has made it difficult for them to quickly adopt new technologies because they only make decisions related to such technologies after there are enough mature project cases on which to base evaluations. Similarly, an international respondent said that it is rather difficult for traditional insurance companies to shift their own culture in a radical way. Large companies tend to be wary of reforms because they have sound internal decision-making mechanisms; and if the reform fails, it will have a huge impact on the company. For small companies, a failure has less impact, so they are more inclined to change. Even if they fail, they tend to take it as a learning opportunity.

► **Expect stable and flexible innovation policy support that is based on risk prevention.**

The development of the insurance industry is inseparable from the industry's regulatory environment, and the same goes for insurtech. Respondents generally believe that regulators encourage industry innovation and have been closely tracking the use of new technologies in the industry. In addition to policy support, a significant amount of infrastructure has also been established to drive the development of the industry, such as the China Insurance Information Technology Management Co., Ltd. (CIITC) and the Insurance Exchanges. At the same time, respondents also indicated that regulators have always paid close attention to the prevention and control of new risks such as network security and information security risks. Regulators have also been quick to scrutinise any gimmick products generated by the innovation process and have actively guided and standardised innovation development. Finally, respondents also expressed what future regulatory acts might be in their opinion. They generally hope that regulatory policies are flexible while also maintaining stability. They also hope that policies give insurance companies sufficient room to achieve innovations while maintaining consumer rights and paying attention to the solvency of insurance companies.

► **Various institutions can promote the use of insurtech.**

Some respondents indicated that other entities, such as universities and industry associations, should play a more important role in promoting the use of insurtech. Presently, cooperation between insurance companies and universities really only takes place at the theoretical level, and focuses mainly on a few technologies such as data science and artificial intelligence. Interviewees also indicated that industry associations could play a greater role in promoting specific technologies, setting standards, and building basic platforms.

The Future: The Outlook for Insurtech and Related Suggestions



1.Outlook

► 1) Insurtech-driven reshaping of the industry ecosystem

The continuous evolution and development of insurtech, its strengthened status as important infrastructure for the future of the insurance industry, its deepened bond with the insurance ecosystem, and its closer integration with various scenarios will inevitably push the insurance industry to evolve into a *new insurance* system. The insurance industry's construction of a new future-oriented insurance ecosystem will feature three stages: **optimisation of existing business processes, innovative upgrading, and reconstruction of the insurance ecosystem.**

Insurtech's optimisation of existing business processes: At this stage, insurtech will be more deeply integrated with all aspects of the insurance process, helping insurance institutions strengthen internally. The application of new technologies will result in a strong and intelligent back-office in terms of underwriting and claims, actuarial processes, risk control and customer service. These developments will help the industry meet the diversified needs of a rapidly growing group of front-end users while also improving efficiency, enhancing risk control and reducing costs. Insurtech will also significantly increase the number of customers that insurance companies are able to service. Finally, these new technologies will capture data from various business processes in order to enhance market transparency and facilitate regulatory cooperation.

Innovative upgrading: Strong and efficient back-office capabilities will lay the foundation for diversification and humanisation of the market, which will result in more innovative products and services being offered. With the support of science and technology, the scope of risk protection can be broadened, the after-the-fact economic compensation model can be transformed into a forward-looking risk prevention model, and insurers can offer humanised services that better meet customer's needs. Technology will comprehensively upgrade the insurance model as a whole and better enable the industry to serve the real economy and protect consumers.

Reconstruction of the insurance ecosystem: As insurtech continues to integrate into people's daily lives, the insurance industry will make use of a wide range of technological applications, ultimately reconstructing the industry's value chain and building a new insurance ecosystem. The insurance value chain will be improved, the industry ecosystem will be made more diverse, and the insurance industry will become more professionalised and scenario-based. More and more insurance companies, insurtech companies and third-party service providers will take part in the construction and improvement of the new insurance ecosystem. These companies will form a more comprehensive risk protection network that covers a wider range of business scenarios. This new ecosystem will better serve the real economy and assist in inclusive finance, while also stabilising the national economy. Additionally, at this stage technology will also be able to link regulators more closely with the industry and help them respond to internal and external industry developments more effectively. In this way, technology will drive the creation of the *new insurance* system of the future.

▶ 2) The internationalisation of insurtech

As the world's second largest economy and insurance market, China currently has significant room for improvement in terms of insurance penetration and density compared to countries with more developed economies. In light of the country's talent base and current level of technological development, one can reasonably predict that China will become the most important insurtech market in the world. For this reason, the future growth of the country's insurance industry will not only be reflected through business indicators, but also through the competitiveness of its insurance technology.

At the same time, new technologies have caused the world to be more closely connected than ever before, and insurance globalisation will continue to move forward. In this new round of globalisation, China, as a pioneer in the field of insurtech, should use its first-mover advantage to actively promote the globalisation of insurtech:

- **Export of technologies overseas:**
Thanks to better technological infrastructure and the country's huge market, China's insurtech has a good application base, and has accumulated a lot in terms of both breadth and depth of applications. China's insurtech companies can actively draw upon their accumulated experience to export technologies to the world and empower other insurance markets.
- **Global layout of the insurtech industry:**
While exporting technology, insurtech companies should work to quickly carry out the global development of the insurtech industry. Companies should cooperate with prominent insurtech enterprises from other countries in the areas of business, technology and financing to bring about the comprehensive development of the insurtech industry.
- **The establishment of global insurtech standards:**
The globalisation of insurtech will inevitably bring about the establishment of new global standards. Insurtech regulators from various countries should work together to establish new global rules for the promotion of new types of insurance. During this process, China, as a pioneer in the field of insurtech, can play a more active role through its own experiences with promoting insurtech innovation and regulating the market.



2. Suggestions

▶ 1) Enhance technology capabilities

- **Enhance technology capabilities**

Increase internal technology investments: Insurance companies should increase internal investments in science and technology so that they can develop insurtech and apply it to business processes. ZhongAn Insurance, a leader in the industry, invested almost RMB 500 million in science and technology R&D in 2017, and as a result engineers and technology employees accounted for more than 50 percent of the company's staff. ZhongAn Insurance has created value through the development of key technologies such as cloud computing, the Internet of Things, big data, artificial intelligence, and blockchain, using them to comprehensively empower marketing, distribution channels, product design, pricing and other areas. This large investment in technology has delivered considerable returns, becoming an important engine for the scale-up of the company's online business.

Actively seek external cooperation: In addition to making internal technology investments, insurance companies should seek out external cooperation in order to master core technologies and enhance their own competitiveness. Insurance companies can deploy big data, artificial intelligence, the Internet of Things, blockchain and cloud computing technologies in cooperation with external organisations such as technology companies, universities and research institutions. In this way they can use the technological capabilities of third parties to improve their own insurtech. Insurance companies can also invest in or acquire technology companies and integrate such companies' core values into their own to create a comprehensive closed-loop service ecosystem.

- **Adjust organisational structures:**

Insurance companies should adjust their departmental structuring and functional planning based on their own unique circumstances in order to fully facilitate insurtech innovation. In terms of departmental structuring, insurance companies can reduce resistance to insurtech innovation caused by overstaffing, or by setting up business units or subsidiaries that can provide a broader and more flexible development space for innovation. For example, companies like PingAn Insurance, PICC Group, and Pacific Insurance Group have established specialised technology subsidiaries to facilitate their technological developments. These entities allow them to consolidate their investments in the field of science and technology, expand their development operations, and establish stronger technological capabilities. For instance, ZhongAn Technology, a wholly-owned technology subsidiary of ZhongAn Insurance, researches how to apply cutting-edge technologies such as blockchain, artificial intelligence, big data and cloud computing in the insurance industry. ZhongAn Technology helps its parent company maintain a leading position in the field of insurtech while also promoting the development of the entire insurance industry by providing enterprise-level solutions to other financial institutions and healthcare entities. In terms of functional planning, companies should set up a team to be responsible for the insurance company's technological transformation and



clarify its responsibilities. Such a team should be provided with a certain amount of discretion according to the company's strategic needs. This technological transformation team should aim to strengthen internal cooperation between the science and technology department and other departments within the company.

- **Emphasise talent training:**

As an integrative field, insurtech is driven by new demand and relies on new technologies and platforms. Insurtech combines existing industrial fields and resources to improve the industrial value chain and build a self-sufficient industry ecosystem. For this reason, personnel from the fields of insurance, science and technology have to act together to promote the development of insurtech. Insurance companies should attach great importance to the cultivation of interdisciplinary talent in the fields of insurance and technology. To this end, they should develop effective incentive programmes and compensation systems to attract top talent. Finally, companies should act to reduce institutional restrictions and provide these personnel with sufficient space with which to innovate and develop technological capabilities.

▶ 2) Technology companies

- **Respect the characteristics of the insurance industry:**

The insurance industry is a highly professionalised field, and its essence is risk management. The purpose of insurtech development is not to combine insurance and technology. Instead, insurtech developers need to understand insurance industry operations and problems so that they can integrate the two fields to provide effective solutions. When cooperating with insurers, technology companies should use their understanding and respect for the insurance industry as the basis for their innovations.

- **Comply with regulations and market rules:**

The stable and efficient operation of the insurance market relies on rational and effective regulations and fair market rules. For this reason, technology companies should endeavor to learn the regulations and market rules of the insurance industry. This will enable them to carry out innovations in a practical manner and promote the stability and sustainable development of the insurance industry.

- **Harness technology:**

Technology companies should actively promote the exchange of knowledge and experience between the insurance industry, technology industry and regulators and fully harness insurtech to build infrastructure for the *new insurance* system. In this way, they can truly serve the real economy and society.

▶ 3) Regulation

- **Encourage insurtech innovation:**

Regulatory authorities can adopt a variety of policy measures to support insurtech development, strengthen the application of technology in the insurance industry, and promote the modernisation of the industry. For example, regulators could select a region to serve as a pilot area for a certain business line. In this way, they could provide a real testing environment for technological innovations (a “regulatory sandbox”). During the pilot period, policy requirements can be appropriately relaxed, and the feasibility of various insurtech applications can be analysed while still safeguarding the rights of consumers and ensuring the stability of the industry.

- **Establish a digitalised regulatory system:**

In order to implement more efficient and accurate industry regulations, the regulatory system needs to be digitally reformed. Regulators can digitalise and automate regulatory policies and compliance requirements by building a nationwide data collection, mining and analysis system. In this way, regulatory authorities can reduce the risk of human error, improve regulatory efficiency, and effectively implement regulatory requirements, while reducing compliance costs for insurance companies.

- **Bridge the data gap between regulatory authorities and other entities:**

In order to achieve effective access to and management of regulatory data, regulators must bridge the data gaps between regulatory authorities, insurance companies and other entities (e.g. third-party financial institutions). To this end, regulators need to establish a one-way and two-way data exchange system and set unified data standards. Additionally, regulators should cooperate with other sectors to establish regular and irregular data sharing and disclosure mechanisms to achieve comprehensive regulation of the insurance industry and effectively manage cross-industry risks.

- **Improve regulatory technology standards and management policies:**

The rational and effective use of regulatory technology can improve regulatory efficiency. Regulators need to develop relevant technical standards that are based on regulatory needs and the characteristics of existing technology. These regulatory science and technology standards should be scientific and advanced and feature reasonable indicators. They should also be consistent with national laws, regulations and standards. Additionally, the management policies of the regulatory technology industry itself need to be improved to ensure the orderly development of the industry and better serve regulatory authorities and the insurance industry as a whole.

- **Establish communication and coordination mechanisms for regulatory technology solutions:**

The development of regulatory technology needs to be based on a deep understanding of the entire regulatory framework and its details. For this reason, regulators need to create a more open atmosphere; and regulators, insurance companies and regulatory technology developers need to maintain close communication and coordinate with each other. Establishing an effective communication and coordination mechanism will be conducive to the rational setting of regulatory standards. Through such a mechanism, regulators and insurance companies can provide clear guidance and recommendations for the improvement and upgrading of regulatory technology products in a timely manner, in order to improve regulatory efficiency.

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