

# Research on Data-Driven Business Model Innovation

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## ABSTRACT

Why is Ping An able to cultivate a number of unicorn companies through the implementation of digital strategy? In the past, enterprises' data-driven business model innovation only upgraded related businesses on the basis of existing businesses. This study analyzed the case of Ping An Group and concluded the innovative logic of the company's business model innovation driven by big data. Enterprises can create new customer value through data asset mining, and use the internal ecosystem of enterprises to realize mutual customer drainage and guarantee the realization of value. Theoretically, this study extends the reform process of big data-driven enterprises to the innovation process of new business models. In the future, enterprises can flexibly apply theories to promote internal industrial ecology to give full play to customers' synergies and adjust business models timely in the face of complex environment.

**Keywords:** *Big data, Business model, Innovation*

## 1. INTRODUCTION

With the rapid development of information technology, big data, artificial intelligence, block chain and other technologies, more and more enterprises begin to use the Internet, and human society is entering the digital era. The development of new technology has fundamentally changed the traditional business logic and management ideas, and also put forward new requirements for the products and services provided by enterprises. These changes provide important value for enterprises in terms of initial data analysis, customer discovery, market segmentation, decision support, business model/product/service innovation, etc. The traditional manufacturing industry is also actively transforming its business model into "digital" and "service-oriented". Successful business model innovation is still inseparable from value creation and value realization. Teece (2010) pointed out that the research on the situational innovation of enterprise business model still needs to be further explored. With the development of new technologies, the Internet and big data pose new challenges to the innovation of business models of enterprises. How enterprises innovate business models based on their internal environment, especially their internal ecology, to cope with the changes of external environment has become an urgent problem for enterprises to solve. Therefore, facing the era of

digital economy, VUCA (volatility, uncertainty, complexity and ambiguity) product innovation under the environment of uncertainty, the theoretical circle need further thinking on the basis of data driven, logic, explore new business model innovation can not only ensure value creation and value realization, also can support the enterprise facing the complex environment for business model to adjust immediately.

With the above mentioned theoretical deficiencies, in this study, the social environment in which enterprises make use of big data is taken as the research context, the digital transformation of Ping An Group is selected as the research case, and the unicorn companies such as Ping An Good Car and Lufax, which are incubated in the Internet industry, are taken as the research objects to answer three questions: What is the logic of data-driven business model innovation? How does data drive new business models? By answering the above questions, it reveals the data-driven mechanism, summarizes the importance of data for business model innovation, puts forward the three-stage model of data-driven business model innovation, promotes the theory of business model innovation, and provides reference and inspiration for the practice of enterprise business model innovation in the era of digital economy.

## 2. THEORETICAL REVIEW

### 2.1 Innovation of business model

A large number of researches have expounded the innovation of business model from different perspectives. Foss and Saebi (2017) believe that business model innovation is an organizational change process in which an enterprise adopts a new business model architecture and creates, delivers and acquires value for stakeholders with a new value proposition. Business model innovation is regarded as the key to the success of modern enterprises in the face of the changing environment. Zott and Amit (2010) [1] pointed out that the innovation of business model provided strategic flexibility for enterprises to obtain competitive advantages and improve performance. Amit and Zott (2012) [4] believe that business model innovation means that enterprises design new operating mechanisms to cope with market changes and meet customer needs, so as to create value for customers and obtain profits. Velu C. [2] believed that business model innovation can also be regarded as the commercialization process of technological innovation. Aspara et al. (2010) [6] believe that business model innovation should start from the perspective of marketing. The so-called business model innovation is based on the existing market structure and designed new transaction mechanism and competition rules according to the specific needs of customers. Ding Hao et al. [8] believe that business model innovation is the optimization of the operating system by enterprises, so as to further realize the change of value proposition, creation, acquisition and distribution. In terms of the realization of business model innovation, Giesen Edward [3] divided business model innovation into efficient business model innovation and novel business model innovation. The former refers to the redesign of content, structure and governance elements to reduce transaction costs and improve efficiency. The latter refers to the creative content, structure and governance of the activity system, which is a big change to the existing business model. According to the degree of innovation, Foss Nicolai [5] divided business model innovation into two types: progressive business model innovation and breakthrough business model innovation. The former refers to the fine tuning of value creation, value acquisition and value delivery in the existing business model, which is a gradual change process. The latter is a significant change from the above three elements. On the basis of summarizing different innovation models, Teece D J. [7] believe that the innovation paths of business models can be divided into three categories: first, industrial model innovation, which is mainly the innovation to reach the industrial value chain by creating or entering new industries, reshaping existing industries or using special assets;

Second, revenue model innovation, such as the introduction of new pricing model; The third is enterprise model innovation, which refers to the innovation of organizational structure and network relationship in the value chain. Although the business model innovation has been clearly stated in these studies, there is still a lack of research on the internal and external environment faced by enterprises.

### 2.2 Data-driven innovation of business model

Big data technology provides new innovation environment, tools and methods for enterprises to interact with users, which can not only optimize the product innovation process and the digitalization degree of high ordinary user behavior, and also support enterprises to build an innovation environment of continuous improvement, guide and maintain the innovation ecology (Garousi V.) [10]. Existing researches pay more attention to the research of big data and enterprise product innovation. The research is mainly conducted from the perspectives of interaction, adaptability and innovation. From the perspective of interaction, Moe and Schweidel (2017) [12] pointed out that data-driven product development and innovation have formed qualitative changes in iteration. Product feedback, which used to be weekly and monthly, can now be done much faster. The network can better match customer demand with innovative solutions (Zhang et al., 2017). From the perspective of adaptability, Ghasemaghaei et al. (2017) [11] pointed out that under the application of big data, product R&D and innovation through data mining can adjust the direction, structure, process and strategy at any time. From the perspective of innovation ecology, it is more about studying how big data can help enterprises acquire resources in the whole ecology and improve their interaction and liquidity (Zhan et al., 2017). With the help of big data, it can promote the iterative evolution of innovation system and improve innovation efficiency (Ding Hao, Wang Bingcheng, Fan Liu, 2013) [8].

In terms of the process innovation of big data-driven enterprise business model, it is believed that big data has become a production tool as important as oil, and the reallocation of resources by applying big data can double the realization of resource value. Luo Lin (2020) [9] believes that the transformation process of big data-driven enterprises can be divided into three levels. The first is to realize customized production and reorganization of production process through the collection and transformation of big data. Second, from the perspective of existing products, the application scenario of big data is applied to the production process of products. The development of e-commerce is a typical case of the combination of data and traditional retail to produce a new

transaction mode. Third, big data promotes the value creation of existing business models.

In short, the innovation of the existing business model promoted by big data is more based on the improvement of the original business model, which does not involve mining the potential needs of customers through big data and applying big data to new business models. In order to fill the research gap, this paper starts from the case of Ping An group to explore new business models and generate new businesses through big data mining.

### **3. RESEARCH DESIGN**

#### ***3.1 Research methods and case selection***

For further research on big data driven enterprise business model innovation of new phenomena and the process of change, this paper uses the vertical single case study method, digital strategy implementation case to explore in peace group as the main line, in the big data, artificial intelligence and other new technology driven enterprises changes under the big background, key research with big data method Ping An Group digital strategy and to foster new business methods. The reasons for choosing Ping An Group as the case are as follows: First, Ping An Group has a large amount of customer data, and the outside world pays more attention to its ability to better play its advantages on the basis of big data mining, so as to guide more enterprises to provide more valuable services for customers and realize customer value. Second, past enterprise data mining research on business model innovation is more use of data mining for customer service, provide the existing business model on the basis of product innovation, and the case of ping an group can better understand how to on the basis of existing data mining to create new business models, give play to the role of group internal industry ecological synergy, create more value for customers, and realize the leap-forward development of new business.

China Ping An Financial Holding Company (hereinafter referred to as "Ping An Group") was founded in 1988 and is headquartered in Shenzhen. So far, it has developed into an integrated, close and diversified financial services group with insurance, banking, asset management, Internet, etc. Ping An Group is one of the earliest a batch of financial holding company in our country, is also one of the most developing financial holding company. Ping An Group, a total of 24 subsidiaries, covering insurance, banking, securities, funds, trust industry fields, such as in the Internet business, Ping An Group has been hatched by Lufax, financial One Bill Pass, Ping An Good Medical, Ping An health science and technology the four unicorn companies represented by a series of financial technology and medical

technology platform. In early 2016, the Group developed a 1-2-2-N strategy focusing on big financial assets and big healthcare. Therefore, Ping An' s big data and artificial intelligence businesses also focus on finance and medical treatment.

#### ***3.2 Data sources***

To ensure the reliability and validity of the case study, this paper adopts the method of combining primary data with secondary data to collect data. In terms of primary data acquisition, this paper mainly adopts the interview method to better study the development of the group. The interviewees are mainly new business customers, original business customers (insurance, bank), staff and managers. New business customers mainly refer to Ping An Good Car, Lufax, Vantone, Ping An Good Medical and other new business users. The original business customers refer to Ping An' s traditional insurance and banking customers. In this paper, 120 stakeholders were interviewed about the relevant business situation through interviews. In terms of secondary data, about 100 related materials are obtained mainly through the company's website, media reports, official accounts and network reports. The Juchao information network obtains the financial report to include the company's annual report, the quarterly report and so on related information about 80. Through CNKI, Weipu and other databases to search the company's related journals or reviews about 120 articles, and these materials were systematically analysed.

### **4. CASE DISCOVERY**

#### ***4.1 Integration of data channels, mining customer demand***

Through case study, this paper finds that Ping An Group's business model innovation comes from its mining of existing business data. Early Ping An Group centered on data, the data as a strategic transformation of the first productive force, which applied frontier technology comprehensively in the product innovation, customer marketing, business operations and risk control and other fields, built "3 + 2" pattern of science and technology platform, continued to upgrade the traditional business, business model innovation, improved operational efficiency, built financial technology "guardian". At this stage, the emphasis on data is just technology enabling the existing business to improve its efficiency. In 2017, the group gradually integrated the data of various business departments. The newly built big data system connected the original internal data system, and any data could be shared and

intercommunicated in the new system, so that comprehensive operation analysis and risk management analysis could be conducted based on the data processing capacity of the new system. In the new system, data information is divided into clients, products, institutions and other topics of different dimensions, and in-depth analysis is made on customer relationship management, risk control, cost and profit analysis and other aspects. After the establishment of the platform, Ping An Technology started to set up data concentration, and carried out in-depth comprehensive application of underlying data through cleaning, integration, etc., so as to better mine the value of data for customer portrait and mining new business from customer portrait. The company gradually takes finance as the starting point, and the data enables finance, medical care, smart city, real estate and automobile five ecological circles, so as to realize business model innovation in these

business fields. For example, through Ping An Good Medical, existing customers can connect doctors, insurance companies, medical insurance, hospitals, clinics, inspection and testing institutions, emerging smart devices and various health service providers through the platform. The Internet health management + medical ecosystem built by the group breaks through all the links of disease prevention, disease treatment, disease payment and post-illness recuperation, thus broadening the service scene and income source of mobile medical field. The data from this platform can better record the patient's individual attributes, clinical indicators, hospital attributes, hospital arrival and treatment, so as to better provide personalized services for customers. The starting point for this data is more the customer's health insurance purchase history. In a word, the company can better provide personalized service for customers through getting through all data links.

**Table 1 Descriptive statistics of case data sources**

Data resource	Primary data				Secondary data		
	interview	Number of interview words	The number of interviews	interviewee	Company website, media report, official account, network report	Corporate financial statements	document literature
Ping An Group	200 minutes	35000 words	25 people	New business customers, original business customers (insurance, bank), staff, managers	100	80	120

**4.2 Mining data resources to achieve customer transformation**

Benefiting from the continuous integration and mining of data, Ping An Group has gradually empowered its existing businesses. In the early stage, the Internet finance developed by Ping An Group, such as online insurance and electronic wallet, can bring great convenience to customers and encourage more people to use the products of Ping An Group, thus increasing the number of customers of Ping An Group. Ping An Group develops Internet finance to effectively improve its efficiency and reduce costs in the future through Internet technology. For example,

Zhong An online insurance company can reduce the fees paid by Ping An Group to agents and reduce the cost of business expansion. And it costs much less to run a network than an entity. Based on such a concept, Ping An Group continuously realizes the mutual coordination between resources and customers in various related fields through mining data value, and gradually extends to related businesses based on insurance and banking.

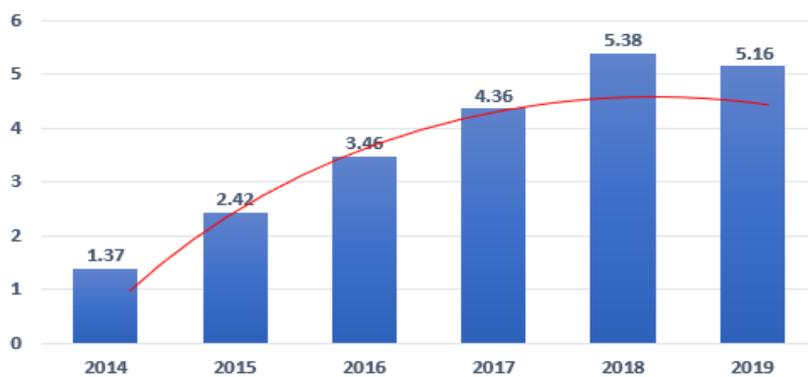
Ping An Group relying on financial holding company development model, its main advantage is: relying on the headquarters of the group strategy control advantage, the subsidiary of marketing network, channel platform, information technology, human resources, intangible assets such as resource sharing

and integration, the mutual coordination and day-to-day operations for subsidiary, ping an group in this way, can let the group's subsidiaries to mutual effective fusion between financial business, to make all kinds of information sharing of immediately, let the customer resources are fully mining, can further reduce the transaction costs between subsidiaries and affiliates and business and so on. At the customer level, due to the advanced nature of financial customers, various businesses that increase customer value can be carried out on the basis of existing customers. From the perspective of customers, they can also obtain more comprehensive services through a platform, which reduces the time cost of moving from one organization to another, so as to achieve multi-win. Based on such a concept, Ping An Group continuously relies on the customer data of insurance business, continuously expands the automobile aftermarket, and realizes one-stop services from insurance, maintenance, car repair and rescue. In the field of big health, Ping An Group also realizes the leap-forward discovery of business based on insurance customers, innovatively creates the business ecology of big health and creates an innovative business model belonging to Ping An Group. In view of this, the key to the rapid development of Ping An Group lies in its customer-based data mining and continuous promotion of internal collaborative development. The main path and way of its core competitiveness in the market is to comprehensively enhance the synergies between the group and its subsidiaries and between them.

In terms of customer collaboration, Ping An Group has also formed a joint force of mutual migration within the group. In the early stage of strategy implementation, the group continuously guided existing insurance and banking customers to its

internet technology subsidiaries, and at the same time reversely guided the customers of these subsidiaries to insurance and banking services, finally forming a joint force of customers. After several years of cultivation and exploration, the internet finance business of Ping An Group grew rapidly in 2014, which integrated financial services into life scenes and was widely recognized by users. Up to December 31, 2014, Ping An had 137 million internet users and 69.25 million annual active users. The total number of users of internet financial service companies such as Lufax, Wan Li Pass, Ping An Pay, Ping An Good Estate, Ping An Good Car, Ping An Financial Technology and so on reached 91.41 million, among which 38.15 million, accounting for 41.7%, hold traditional financial products. It has 27.67 million annual active users. In 2014, Ping An Group actively and synchronously promoted the business layout of mobile terminals, with the total number of Ping An APP users reaching 19.71 million and annual active users 14.1 million. Among them, the total number of the internet finance business company APP users reached 10.16 million, and the annual active users reached 7.04 million (Figure 2-4 for details). At the user level, the number of internet finance users has also increased year by year, from 137 million in 2014 to 516 million in 2019 (Figure 1 for details).

In a word, Ping An Group by market continuously strengthen their internal data communication in the field of investment, through related investment achieved in areas such as financial and health development of a new business model, to promote the ecological construction of the various business plates, for different customers demand in Ping An Group are satisfied between different business, ultimately promote the group's diversified business leap-forward growth.

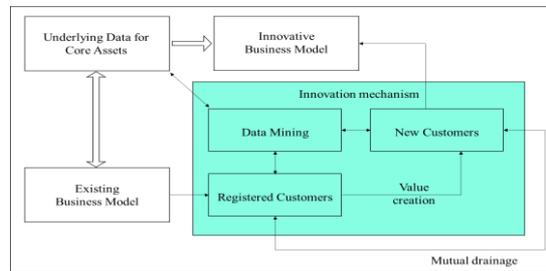


**Figure 1** Changes in the number of internet finance users from 2014 to 2019

### 4.3 Business Model Innovation under the big data scenario

The case shows that the core asset of the company is the underlying data. Enterprises can improve customer satisfaction and service quality by integrating the underlying data of each business segment and mining the data of registered customer groups under the existing business model. At the same time, the company can also draw customers based on the data mining of registered customers, explore the value demand of registered customers, give registered customers more value through value creation, develop new business models, and achieve

new business growth. The new business model not only meets the requirement of the company's development, but also satisfies the customers' one-stop solution of different requirement. The mining of these requirement depends on the grasp and cognition of their own customer data. Only by taking the existing data as a starting point and constantly expanding the value chain, can we better create value. Create a new business ecology through value creation, finally realize mutual drainage from new customer groups to registered customer groups, and realize the coordinated development of the company's internal business ecology ( Figure 2 for details).



Source: This paper

**Figure 2** Business model innovation in the context of big data

## 5. CONCLUSION

Integrate the underlying data of customers to form the data synergy

The company does not pay enough attention to the standardization of data, which makes it difficult for the underlying customer data of different businesses to form synergy. On the basis of studying the characteristics of different businesses, the company should work out the data standardization mode of the whole company, continuously accumulate the underlying customer data, break the internal data sharing barriers, strengthen the data sharing of different business departments, and jointly conduct data mining to form the data synergy.

Mine customer potential demand, develop new business

With the value discovery of customers as the core, we constantly draw images of customer groups through customer data and explore the potential business of customer groups. With the model of customer butler, we can solve the potential demand of existing customers from multiple aspects, and achieve one-stop service. Under the concept of one-stop service cluster, we can explore new businesses and new business models that serve customers, continuously provide services far beyond customers' expectations, and realize the leap-forward development of new businesses.

The old and new forms of business lead each other

In the early stage, the research on the business model of big data is more about the combination of online business and offline business, so as to improve the

conversion rate of customers. With more and more fierce competition, the cost of acquiring customers is higher and higher. Through the existing mature customer base, the company can continuously introduce and guide the existing customers to the new business. Such guidance not only reduces customer acquisition costs, but also increases customer stickiness. With the development of new business, customers attracted by the new business can further "feedback" the original business and realize the collaborative development of old and new businesses.

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