

Research on Business Model Innovation Based on Big Data

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Abstract: This paper starts from the realistic needs of big data value management, from the two aspects of business model innovation and IT ability, constructs the theoretical analysis framework of the direct and indirect impact of big data on business model innovation, and selects the leading country in China's big data application. The power grid conducts case studies to explore the innovation process of the business model in the context of big data. By dividing business model innovation into three stages: value discovery, value creation and value realization, analyze the direct impact of big data on different stages of business model innovation; introduce IT ability as an intermediate variable, analyze the impact of big data on enterprise IT ability and its ability. The impact of business model innovation, the indirect impact of big data on business model innovation, and the construction of a business model innovation analysis conceptual model based on big data. Through the case study of the process of using the big data for business model innovation to obtain competitive advantage, it is found that big data has direct and indirect effects on the three stages of innovation of enterprise business model. Enterprises use big data for business model. Different stages of innovation and different priorities often bring different business model innovations to the company, thus forming a differentiated competitive advantage.

1. Introduction

At present, the business model with big data as the core presents a diversified situation. How to use the big data as the driving force in the Internet background to build the competitive advantage and core competitiveness of its own ecosystem is the key to the sustainable development and survival of the enterprise. Financial services companies improve their user experience, improve their competitiveness, and maximize operational efficiency by analyzing and using big data to verify compliance and monitor financial fraud. Banking companies can use big data to discover credit card crimes, such as misappropriation and fraud; wealth management websites can use consumer statistics to conduct trend analysis and display; insurance companies can also find potential risks through them.

2. Business Model Innovation Conceptual Model

In the era of big data, in addition to comprehensive collection of internal data, companies can also integrate with external data or purchase professional data services to enhance their own data processing capabilities. As an important resource (asset) of the enterprise, big data can comprehensively enhance the enterprise's IT ability, and can act on the three stages of discovering value, creating value and realizing value, and then positively affecting business model innovation.

In the value discovery stage, the enabling function of IT capability is mainly reflected in the comprehensive insight into the external environmental changes of the enterprise and timely response, accurate prediction of business trends, improvement of enterprise innovation capabilities, and rapid adjustment and deployment of new strategies. IT technology has changed the way companies provide marketing services and product development, enabling enterprises to deploy flexibly, which is conducive to maximizing value creation. Companies can analyze opportunities that are overlooked by competitors, including globalization and differentiated services for market segments based on

customer needs, determining the relationship between the business and customers, supply chains, partners, and investors, and giving the company a competitive advantage.

Combining the three stages of value proposition in business model innovation with enterprise enable capability, this study constructs a business model innovation conceptual model based on big data, as shown in Figure 1.

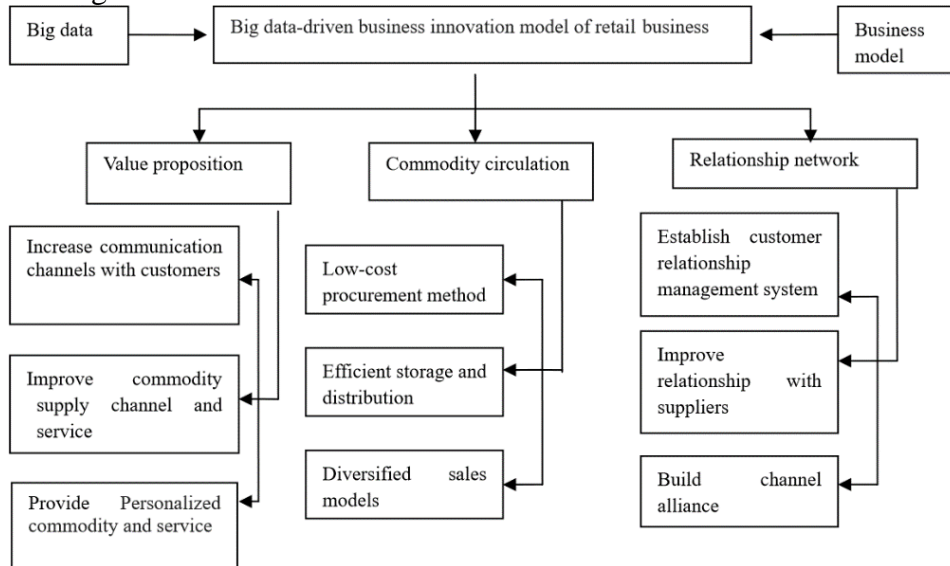


Figure 1. Business model innovation conceptual model based on big data

On the one hand, big data directly promotes the innovation of business models, is the method, means and tools for the realization of business model innovation; on the other hand, it directly enables and supports the evolution of information technology, systems and its capabilities, and promotes IT information system. And the development and innovation of capabilities, the development and function of its ability to achieve the renewal and transformation of the enterprise's ability set, and ultimately lead to changes in the components of the business model of the enterprise, driving the innovation of the business model of the enterprise. It can be seen that the big data-driven business model innovation with the ability of it is a kind of idea that uses big data as the motivation, using IT technology and other information technology to drive the transformation of enterprise organizational elements, and then realize the innovation of enterprise business model.

The role of big data as an information technology in the business model innovation process includes three aspects: value discovery, value creation and value realization, respectively for the external environment of the enterprise, market opportunities; internal processes, finance, human resources, etc. System; external product innovation, customer relationship, revenue model, etc. As a direct information technology, big data is an important cause of enterprise business model innovation; on the other hand, as a driving force, big data is based on its ability. It has played a role in the transformation of the enabling role (leverage), supporting the IT system to realize the innovation and transformation of the business model from the three aspects of value discovery, creation and realization, and is also an important condition for enterprises to achieve business model innovation.

3. Case Analysis

3.1 Data source

This paper conducts in-depth research on business model innovation triggered by big data in a qualitative way. The data is mainly divided into primary data and supplementary data. The primary data comes from in-depth interviews with relevant industry experts and big data related experts. Including related seminars, research reports, journals, books, online news materials, etc.

(1) In-depth interview: Through interviews with big data research experts and Juyun Haohai Big Data Company, we have an in-depth understanding of the realization process of national grid big

data development and business model changes from different levels and perspectives.

(2) Research reports and books: Due to the large number of academic research related to big data business model innovation, the cases related to the impact of big data on business models from Internet related reports, big data related professional books and business model related books. The acquisition of the case provides a very high reference value for fully understanding the current case analysis of big data development and business model innovation.

(3) Media reports: including media websites of various communication industry, public portals, special reports of major conferences, industry journals, communication industry theme forums, official microblogs and other media, fully access to information.

(4) Archives records: including company annual reports, company website information, power industry website information, etc., to understand the development trend of big data business, strategic analysis published by the website, performance evaluation charts, investigation reports, etc., supplement existing information, and use the collected information. The archival record verifies the accuracy of the information obtained by other sources.

3.2 Case introduction

With the development of smart grid, State Grid Corporation has initially built a leading domestic and world-class information integration platform, and has successively put into operation three centralized data centers, expanding the application scope of the first-tier deployment business, and operating the structure on the line. And unstructured data centers, it can be said that the business data of the grid from the scale and category has begun to take shape. The business data of the State Grid can be divided into the following three categories: First, the grid production data, including data on power generation and voltage stability; Second, grid operation data, including data on transaction price, electricity customers, and electricity sales; It is the enterprise management data of the power grid, including data such as erp system, collaborative office, and integrated platform. After gradually popularizing smart meters, the timeliness of grid business data will be further enriched and expanded. The State Grid has obtained massive and real-time grid business data. It has the characteristics of scale, diversity and real-time. There are demand for storage, analysis and management of big data, and there are many successful cases.

4. Business Model Innovation Case Analysis

4.1 Direct impact

The power grid information collection system of the State Grid adopts the cloud-based industry data processing platform and is based on open source Hadoop to support complex computing and operation and maintenance management. The system collects and analyzes the electricity consumption data of the entire network of power users (more than 10 million households) every 15 minutes. Through the pilot implementation of the cloud data industry big data processing platform and comparison with the traditional scheme, the electricity consumption data can be stored in the platform in real time, and the daily calculation of power consumption, terminal traffic statistics, data integrity rate analysis and other business calculations are more efficient than small racks. The solution for relational databases has increased by 6 to 20 times, while the cost is only 1/5 of the traditional solution. The collected and processed power consumption data can also deeply realize the functions of customer power behavior analysis, power load forecasting, marketing data analysis, and power equipment status evaluation.

The State Grid implements the power marketing construction of the “big marketing” system, the construction of the marketing inspection and monitoring system, the 24-hour customer-focused centralized customer service system for the customer service, and the marketing management system for the localized management of the business. Based on analytical data and based on customer and market, the company constructs an analysis model of marketing audit monitoring to establish a systematic algorithmic model library of exclusive marketing, thereby discovering hidden relationships in data and providing intuitive, comprehensive and multidimensional And in-depth

power forecast data, improve the insight market of decision makers at all levels of the enterprise and can adopt effective marketing strategies, optimize the existing marketing organization system, improve service quality and marketing ability, and thus improve the overall marketing ability of the enterprise. To ensure the maximum benefit of enterprises, users and social economy.

National Grid uses big data technology to assist the effective operation of its operational monitoring system. The fund revenue and expenditure management in the operation monitoring system mainly monitors the sales data of the marketing, financial changes, bank accounts and other data in real time, mainly including the capital inflow, capital stock, capital outflow and bills receivable. Indicators. In the system, through the implementation of the cloud leopard stream processing platform, the index calculation and monitoring and warning of all the changed data are realized every 5 minutes, and more than 20 million transaction data can be processed at the peak. In addition, the State Grid will also apply big data to the oa office system, that is, collaborative office platform, use the cloud computing model to build a virtualized unified management application, and use distributed big data storage to solve storage pressure.

State Grid Corporation built a unified fund scheduling and monitoring platform to meet the needs of centralized fund management and risk prevention and control, and launched a comprehensive promotion in 2013. The system covers seven functions, including bank account and ticket monitoring, financing and reconciliation monitoring, revenue and expenditure monitoring, fund planning monitoring and monitoring analysis. The business management of the provincial and company branches, including the collection, balance, discount, purchase and payment of bills, bank settlement notes, etc., has been integrated into the line, establishing a bank account system with clear collection paths. The fund plan has realized online approval and full-time monitoring, including vertical declaration, review, summary and release, opening, change and cancellation of bank accounts.

4.2 Indirect impact

The power plant-related production processes, such as approval procedures, safety procedures, purchase requisitions, and issue records, are faithfully recorded on the information system, and are standardized by the information management system, and successfully achieve procurement and warehousing, and will purchase the functions of equipment management and other functions are unified on the production management platform, which realizes the integration of business data and solves the problem of information islands. In addition, the company accumulates the maintenance experience of power plant maintenance personnel in real time through standardized maintenance management and work order management. The knowledge of the maintenance personnel is transformed into the intellectual resources of the power plant, and the future production management work of the power plant is known, and the production cost of the enterprise is truly reduced through such a process. In addition, in the power production process, the State Grid is trying to use the big data analysis technology to calculate the threshold of the transmission power online under the influence of voltage and other related factors on the power limit, so as to properly set the output power of the system and effectively balance the system economy and security.

At present, there is a widespread use of electricity consumption in residential areas and unreasonable use of household electrical appliances. Not only that, but the increasing number of electric vehicles has also made the situation of electricity use more severe, and the lack of effective technical facilities for residents has led to an increase in power wastage serious. Power companies that implement smart meters abroad have more successful experiences in using smart meters. For example, smart meters can record the electricity consumption of households at various times, which enables power companies to differentiate according to electricity consumption and electricity season. Pricing, such as increasing pricing during peak hours, allows users to avoid peaks in electricity usage and change usage habits, thereby delaying large investments in power infrastructure such as building new power plants. In addition, the new billing model of power companies that implement smart meters abroad can further increase the flexibility of power companies. For example, when some emergencies make power supply scarce, power companies can suppress people's demand for

electricity by raising electricity prices. Avoid a larger power shortage due to excessive grid load. In addition, when the power company enters some electricity with higher power generation costs into the power grid, the power company can appropriately increase the electricity price within the scope of the policy. With the popularization of this billing method, the refrigerators and washing machines produced by the future home appliance manufacturers will automatically adjust the mode according to the electricity price, and automatically adjust to the energy-saving mode or the standby mode during the peak period of power consumption.

By using electricity to control electricity consumption, it is possible to achieve the use of peaks, achieve the goal of cutting peaks and valleys, and effectively tap the potential of energy saving. In addition, business users are also the focus of smart grid development. Big data analytics technology can help validate the effectiveness of smart grid technologies for pilot projects, which are critical for the future deployment of smart meters and the development of renewable energy. Through the innovation and application of big data technology, the grid users are provided with new intelligent power consumption and energy saving strategies.

5. Innovation Optimization Suggestions

China's power industry has experienced rapid development for several decades. At present, the next generation of intelligent power systems has been fully developed, and the largest domestic data platform has been gradually established. On the other hand, the in-depth business application of the power industry has also led to the explosive growth of industry data, and traditional information processing methods face enormous challenges. For the entire power industry, power big data runs through every step of the production and management of the power industry in the future, and plays a unique and significant role, helping the power industry to successfully build the next generation of industrial systems, effectively responding to environmental pressures and resources. Problems such as increasing scarcity and achieving sustainable green development. Supported by emerging technologies, big data technologies and applications are integrated into the power generation, transmission, power and substation of the smart grid in the power industry. In this regard, the State Grid as the main force of China's power industry has taken the pace of exploration.

Although various industries in China have gradually begun to apply big data, for example, in this case, the national grid is the leader in big data applications in the industry, with more successful cases and experiences. But in general, domestic big data applications are still in the process of exploration and pilot, especially in the traditional industry. Based on the research results, this paper puts forward the following suggestions for domestic enterprises to carry out big data application and business model innovation:

(1) Strengthen the cultivation of value discovery ability

Value discovery needs to be perceived from multiple aspects such as environmental change, technological progress, and customer value. It needs to collect a large amount of customer information and analyze it, carry out refined customer segmentation, understand whether customers have needs and specific needs, and understand external environmental changes and potential competition, collaborators, etc., new technical situations and specific needs in the market, to understand the changes in the external environment and potential competitors, partners, etc., new technology in the market. However, it is not possible to simply imitate successful foreign companies' applications of big data and realize the model of value discovery innovation, such as Tesco and Harrah's, which are successful enterprises in this area and establish obvious competitive advantages, but complete imitation does not ensure success. On the contrary, it may be counterproductive. Only by fully examining the company's own situation and needs, combined with big data applications, can we truly explore the value of big data and realize value discovery.

(2) Emphasis on the establishment of internal value networks

When an enterprise pays attention to the external environment and seeks value from it, it should not neglect the construction of its own business process, supply chain, and IT system. Enterprises should consider whether they have the ability to innovate and ensure the quality of service. Can they

accurately and quickly the value found is quickly realized. Cases show that fluent and efficient business processes can make products and services more reliable, which can significantly improve customer satisfaction and maintain competitive advantage.

(3) Strengthen the commercialization of big data products

At present, most enterprises are still on the paper stage of big data application. They say much, do less, and have a far cry from similar companies in the United States. In the era of big data, data analysis has become the foundation of all activities of enterprise operations, including enterprise management, decision-making, sales, etc., which should be driven by data, rather than “experience” or “intuition” in the era of non-big data to drive. As a result, the collection, storage, processing, and analysis of data has become a key business for every company committed to making a difference in the era of big data. Only when the business of big data can operate successfully can the business model of the enterprise achieve its value.

6. Conclusion

This study is based on the big business model of business model innovation, using case studies of the national grid case, and discovering the innovation of big data to business model by examining the process of national grid's use of big data applications for business model innovation and gaining competitive advantage. The process does have direct and indirect effects. On the one hand, big data as an emerging technology application directly affects the company to enhance environmental insight, discover customer value, improve internal operations and innovative product services and profit models to achieve business model innovation; on the other hand, big data as an it technology directly promotes the enterprise's IT system and its capabilities. Whether it uses distributed storage to change the way of enterprise data storage, or uses distributed computing to improve the efficiency of IT system analysis, it can improve it. System efficiency, and in turn, improves business model elements and serves as an innovative business model. The successful operation of big data can bring a new type of data operation and maintenance, form a new delivery method and consumption form, and bring new experience to users, and further promote grid production and enterprise management, breaking the traditional power system business. From the perspective of data analysis and management, it provides more powerful, longer-term and deeper support for the production and operation of enterprises and the construction of a strong smart grid.

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