

Feature Article

Enterprises' big data capability building and internet transformation: A case study of Suning

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1. Introduction

As one of China's largest traditional offline home appliance chains, Suning Corporation was once tremendously impacted by E-commerce, online marketing and other means, and it even faced the risk of being reduced to a large offline showroom for E-commerce. In 2009, Suning initiated its arduous efforts towards Internet transformation through big data technology. Six years later, it eventually achieved impressive results. So far, Suning has made considerable progress in specialized services such as E-commerce, logistics, finance and O2O. While having 1,577 offline physical stores, Suning has built an open cooperation platform for suppliers and merchants based on big data technology. In this way, Suning has achieved integration of shopping in stores, on personal computers, on mobile phones and on household TVs. In 2016, Suning Corporation ranked among the top 3 of China's B2C enterprises with a total online transaction volume of over RMB 100 billion Yuan. In addition, it has been a leader in the development of online to offline (O2O) retail in China.

Through the case study of Suning Corporation's successfully achieving strategic and business model transformation, this paper concludes that enterprises' Internet transformation needs the support of big data capabilities in fundamental technology, operational management and strategic innovation. See Figure 1.

2. Fundamental capability in big data

Fundamental capability in big data includes the big data infrastructure deployment capability and the big data technology R&D capability. The big data infrastructure deployment capability means the enterprises' fundamental capability to obtain big data and ensure the real-time sharing of big data. Enterprises need to not only have traditional office automation, ERP and other systems, but also have data acquisition and storage devices for the Internet of Things, cloud computing, social media and other information technologies [Ostriches-Singer and Zalmanson, 2013]. They also need database and software operation and maintenance personnel. The big data technology R&D capability includes data processing and mining capability, capability in customized data visualization, and capability in regular operation and maintenance of distributed data infrastructure. See Figure 2.

First of all, Suning's successful Internet transformation resulted from its existing solid informatization. As early as in 2000, Suning proposed the "E chain" model. With the support of over 4,000 information technicians, Suning built a real-time intelligent network integrating data, voices, videos and monitoring, and independently developed over 120 information management application software and sub-systems in 10 categories covering operation, management and service. In



Development-oriented Innovation: Using data to innovate the existing markets, technologies and operations

Exploration-oriented Innovation: Using data to explore and identify innovations disrupting the existing markets or technologies

Optimizing Processes: Using big data technology to transform and optimize existing business processes

Data Sharing: Analyzing the data needs in different links. Developing Data Shared by Enterprises

Infrastructure Deployment Capability: Facilities, software, databases and personnel

Technology Research and Development Capability: Data processing, data mining, visualization, etc.

Figure 1: Enterprises' big data capability building system based on the internet transformation

2005, Suning worked with SAP, IBM and other companies to establish the ERP system and complete Phase 1 project of the online shopping mall. In 2007, Suning achieved the nationwide coverage of its online shopping mall. Therefore, Suning had preliminarily built network information business processing capability when it planned to launch into E-commerce in 2009.

However, in 2011, Suning realized that the relatively closed-ended information system already could not meet the new requirements of the Internet environment, so it needed a more open and more scalable information technology architecture [Xu, 2015]. Therefore, Suning's executives decided to use big data, cloud computing, social media and other new information technologies and tools for the paradigm shift of the company's existing IT architecture and the "four in one" model: to build a new type of informatization data management platform based on fundamental capability in big data through the integration of the multimedia transaction network, the store experience network, the logistics network and the management network.

Through the new open-ended information network and ecosystem, Suning fully integrated the resources on the existing information platforms, not only having preliminarily built China's largest B2C market specializing in electrical appliances, but also having expanded the product lines from traditional home appliances and 3C to general merchandise, daily necessities, books and virtual products. Meanwhile, Suning Online Shopping Mall was renamed "suning.com". In recent years, Suning has increased its investments in R&D of fundamental and other aspects of big data. In 2013, Suning established Suning Silicon Valley Research Institute (Phase 1) with USD 5 million; in 2016, it acquired the big data company Allyes at USD 15 million, aiming at in-depth research in O2O, intelligent search, big data and other fields, and further development of precision marketing, automated advertising and other Internet technologies and services.

3. Operational capability in big data

Operational capability means datamation of various cor-

porate practices and processes. It is generally believed that practices and processes help organizations operate stably and efficiently. When building operational capability in big data, enterprises aim at data-based operation through expression, support and improvement of existing practices and processes with the help of big data technology. The essence is to enhance organizational efficiency through big data technology.

Operational capability in big data requires enterprises to build Internet-based end-to-end processes while sharing data as far as possible. Research shows that data and processes interact with and complement each other. On one hand, accumulation and analysis of large amounts of data can bring valuable information and knowledge, which is useful for optimization of existing business processes. On the other hand, analysis of data needs in different links based on the optimization of business processes can promote the formation of shared databases.

Before 2012, Suning generally focused on professional and meticulous management of electrical appliance sales. Besides, its IT system was developed mainly to enhance execution through simplification, standardization, institutionalization and informatization. Suning required that all the operational data should be determined in advance and then reproduced and disseminated through the information system. However, as Suning's online and offline system functions were not completely unified at that time, some operational data were dispersed and fragmented. In the E-commerce battle in 2012, Suning's traditional operational model was strongly impacted by Internet enterprises. In addition to the disadvantage in the single category, the more serious problem was the difference between online and offline sale prices of some commodities, so that Suning was in the passive position in competition and even lost the existing advantage in sales of electrical appliances.

Faced with this situation, Suning decisively made adjustments. For one thing, Suning was committed to changing its existing IT architecture; and for another thing, Suning proposed to "put stores on the Internet" and implement the strategy for online to offline (O2O) integrated development through

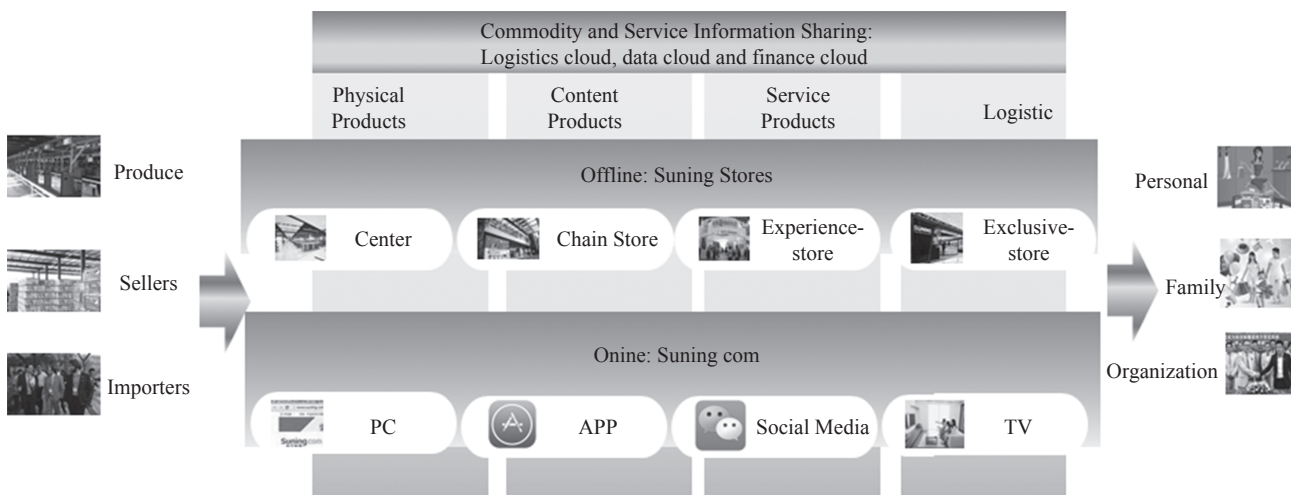


Figure 2: O2O operational system of Suning's retail business

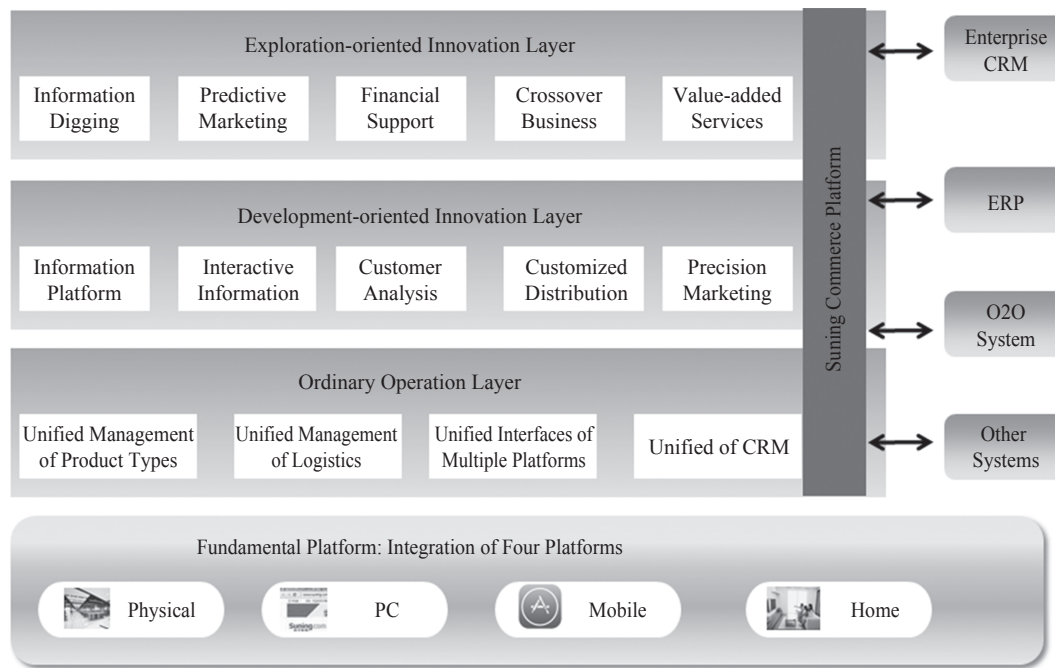


Figure 3: Suning's business layers based on big data capabilities

big data technology. In the second half of 2012, Suning Corporation started the full integration of offline stores and suning.com in organization structure, information system and other aspects. Consequently, the two systems were fully integrated from supply chain to commodity sales, distribution and service, sharing back-office inventory, logistics, information and services. With the help of the back-office information system, the company could fix the transaction prices of the same commodities in stores and on suning.com, and stores could check price changes through the sales terminal every 1 to 2 hours. In case of changes, stores would immediately replace the corresponding commodity price tags. After integration of the internal system and supplies' systems, Suning officially announced the "same price" policy in June 2013. After that, the number of visitors to stores began to pick up, the number of downloads of suning.com APP rose greatly, and there were stably over 6 million daily user clicks on suning.com [Yang, 2010]. It could be observed that Suning's using big data technology to improve the real-time operational capability effectively supported the implementation of the "same price" strategy.

4. Innovation capability in big data

Innovation capability in big data means enterprises' capability to use big data to innovate, drive strategic changes and create sustainable competitive advantages. Generally speaking, enterprises can use big data to achieve two types of innovation:

One type is development-oriented big data innovation, i.e., using data to innovate the existing markets, technologies and operations for continuous improvement, enhancement of existing core competitiveness, and maintenance and enhancement of the market position. Data analysis focuses on the existing markets, products or technologies for small-step, local and

short-term continuous improvement. This type of innovation can improve enterprises' learning capability, operational automation, and satisfying user preferences through enterprise-user interaction [Chesbrough, 2006].

After the transition from electrical appliance sale in physical stores to E-commerce, Suning was facing a more complex and diverse environment, and users' needs were more diverse and personalized. To adapt to this change, Suning not only fully transformed its control-strengthening matrix organizational structure to the divisional system to improve market responsiveness, but also explored all-new marketing strategies (mainly reflected in user experience improvement and precision marketing) through the integration of four platforms. In the all-channel retail model, consumers left shopping traces on the "four platforms". Once such traces became data in a certain scale, Suning could use big data to analyze and judge consumers' shopping preferences and buying habits [Brocato et al., 2012]. For example, during the 5-day suning.com "MOMO Festival" in October 2014, suning.com used big data technology and social media tools to analyze customer behaviors. As a result, it sold 3 million pieces of facial masks in just 5 days through precision marketing by gifting product vouchers to specific users and by other means.

The other innovation type is exploration-oriented innovation: Using data to explore and identify innovations disrupting the existing markets or technologies. When an enterprise faces an unfamiliar field (including marketing, technology, etc), it can use powerful data models for analysis and reasoning to find possible opportunities. In this case, data analysis should focus more on comprehensive analysis of non-user and crossover data to seek breakthrough innovations from a disruptive perspective. For example, Suning tried "predictive marketing", i.e.,

dispatching commodities before users' placing orders through analysis and study of marketing information; and bringing surprises to users by thinking ahead of users through communication with users. Take Shanghai Suning's one case for example. When a deliveryman delivered milk powder to a customer, he successfully sold diapers in the appropriate size by analysis and prediction of the big data he brought with him. According to Suning's statistics in Shanghai and Beijing in 2016, secondary consumption from predictive marketing accounted for over 5 %. More notably, Suning expanded and innovated business in other fields by means of big data technology. For example, through the strong big data cloud platform, Suning mined profiles, visits, orders, replenishment and other information of 198 million users and 35,000 suppliers; consequently, it developed well-targeted PayPassport, RenXingFu and other financial products to truly meet consumers' and suppliers' diverse financial needs. At the end of 2015, Suning even established a joint venture named Suning Consumer Finance Company with the Bank of Nanjing and other partners, thereby entering an all-new financial field.

As a result, through development-oriented innovation supported by big data, Suning kept a foothold in E-commerce retail, which nevertheless could not bring Suning all-new competitive advantages. Additionally, through exploration-oriented innovation backed by big data, Suning smoothly expanded to finance, modern logistics and other fields, so that its future development is more promising.

5. Conclusion

Both theories and practices in big data have shown that information technology is not just a simple exogenous factor for enterprises, because with acquisition and processing costs getting lower and lower, big data as a strategic resource will have a significant influence on enterprise strategy and operation, and Internet transformation requires enterprises to achieve datamation reform. As finance author Wu Xiaobo said, "The Internet transformation without technology upgrading is a dead-ended journey." For any enterprise committed to Internet transformation, big data-based decision-making and continuous innovation will be the signs of successful transformation.

This paper identifies the value of enterprise datamation from the theoretical perspective. Through the analysis of Suning's Internet transformation, this paper finds that enterprises can achieve Internet transformation by building fundamental capability in big data, operational capability in big data and innovation capability in big data. First, enterprises need to have a good and sound basis for the application of big data technology through the improvement of organizational structure and management; second, enterprises should optimize existing business processes and enhance their operational efficiency through big data technology; and finally, enterprises should apply big data to two types of strategic innovations, thereby truly turning big data capabilities into core competitiveness.

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