

The Transformation of Traditional Retail Industry in the Era of Big Data

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Abstract: This paper probes the transformation of the Traditional Retail Industry as the modern IT technology that is symbolized by Big Data entre our society and also studies the impact of Big Data on the development of traditional industry and human's daily life. The target is to show people both the advantages and disadvantages of advanced IT technology, moreover, the essay is going to help the public to have a deeper understanding of why the Traditional Retail industry transformed its business online gradually and provide some information to some companies that are willing to shift their marketing method. This paper is written by using Literature analysis and Data analysis. After doing the research, it finally finds that the traditional retail industry must transform and make full use of the advantages of digital information technology and channels for rapid transformation.

Keywords: big data, traditional retail industry, transformation technology

1. Introduction

As time goes through, the pressure that is given by the behindhand productivity of society pushes the development of modern technology including IT technology. The traditional retail industry used to play an essential role in boosting the economy, expanding employment in the society and increasing tax revenue and so on which is extremely important in the development of the economy in the world. However, with the development of big data, e-commerce gradually replaced the traditional retail industry. This paper focuses on the necessity of the transformation of the Tradition Retail industry behind the big background and how can they transform with great efficiency and profit. This paper collects some data that use to attain by the experiment other on the internet and some information from several references with great authority, and then analysis them to obtain the final conclusion. This essay can help some companies that need to transform in the present era but haven't transformed yet to get some idea about how to transform effectively and can help the following reader to have a deeper understanding of the relative topic.

2. Analysis of the Necessity of Big Data for the Transformation of Traditional Retail Industry

With the development of big data, e-commerce gradually replaced the traditional retail industry given that big data can benefit e-commerce in several aspects. First of all, big data have the ability to excavate the trading information that made by the consumers, chase the trading record, and make

predictions so that it can help the sellers to design a specialized marketing mode can inspire the consumer to buy goods, and thus the revenue of the seller may incline with high efficiency [1]. Secondly, it is more convenient for the consumer to purchase the goods they want. Very simple reason, people can just buy the things they want on their phones by only moving their fingers, and also the merchandise online is much more than the commodity that is in a single market offline. Therefore, most consumers would rather choose to buy things online than take the way that is operated by the traditional retail industry. Moreover, big data can also help the e-seller to improve the quality of service. To be more specific, the biggest problem that may happen in the whole process is the time that the consumers receive the goods may be postponed because of some accident that is difficult to prevent. However, big data can easily solve the problem in that it can use Radio-frequency identification (RFID) technology and sensing technology can collect the large volume of data generated during the transmission of goods, then analyze it so that the staff can receive the physical distribution information just by scan QR codes and can also let the consumer know what is the actually time that they can get their goods [2]. In addition, big data can also receive information like weather, transportation and so on. Then big data can make the prediction that will help the goods to be sent in the fastest way.

Under this condition, the traditional retail industry needs transformation and upgrading. Indeed, big data can help this industry to transform that mostly attributed to its four important features: 1. the data included in big data is extremely large 2. the data is viable 3. The information collected by big data has its own value density 4. The data have a high velocity for growth and disposal [2]. At the end of the last century, with the development of the technology of the internet, the emergence of POS management information systems, bar code technology, radio frequency technology, a variety of application software, retail data volume growth played a positive role. By mining and utilizing big data, the competitiveness, market responsiveness, marketing decision-making and environmental adaptability of the retail industry can be improved, so as to let the sellers make the decision-making more scientific. Moreover, by analyzing customer consumption behavior data, retail enterprises can accurately grasp customers' purchasing habits, interests, preferences, brand loyalty and other information. And can analyze data such as the size and structure of consumer groups (such as age, gender, etc.) so as to predict consumers' purchase intention and provide compliance. In addition, according to a reference, some people use three functions to confirm the positive impact of big data on the traditional retail industry.

$$Q\tau(\text{Upgrade}_i) = c\tau + \beta\tau\text{Digitaldex}_i + \lambda\tau Z_i + \varepsilon \quad 0 < \tau < 1 \quad (1)$$

$$Q\alpha(\text{Digitaldex}_i) = \mu\alpha + \eta\alpha\text{SecdigitIV}_i + \pi\alpha Z_i + v\alpha \quad 0 < \alpha < 1 \quad (2)$$

$$V\alpha = Q\alpha(\text{Digitaldex}_i) - \mu\alpha - \eta\alpha\text{SecdigitIV}_i - \pi\alpha Z_i \quad 0 < \alpha < 1 \quad (3)$$

Table 1 is the Full-sample regression results of the impact of digitalization on the transformation and upgrading of Chinese enterprises by using the three formulas that displayed after. The result turns out that despite the row of 0.9 digitalization promoted the improvement of transformation and upgrading degree of enterprises at the row of 0.1 to 0.8 which is a significant positive impact [3]. All in all, big data will definitely benefit the transformation of the traditional retail industry and will contribute to this process in an extensive range of ways.

Table 1: Full-sample regression results of the impact of digitalization on the transformation and upgrading of Chinese enterprises.

Quantile	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Digital index	0.5088* **	0.6862* **	0.7186 **	0.5474 ***	0.4325* **	0.3776 ***	0.3313 **	0.2907 *	0.2351
	(0.1456)	(0.1147)	(0.1201)	(0.0982)	(0.1137)	(0.1429)	(0.1372)	(0.1595)	(0.1658)
Education	-0.0016 (0.0014)	-0.0009 (0.001)	0.0004 (0.001)	0.0008 (0.0009)	0.0028* ** (0.001)	0.0034 *** (0.001)	0.005* ** (0.001)	0.0051 *** (0.001)	0.0065 *** (0.0012)
Innovation	0.2329* *	0.32621 ***	0.3476 ***	0.2667 ***	0.2214* **	0.2606 ***	0.297* **	0.3338 ***	0.3284 ***
	(0.0957)	(0.0852)	(0.3680)	(0.0664)	(0.0718)	(0.0809)	(0.0888)	(0.0927)	(0.1012)
Age	0.0192* **	0.0176* **	0.0149 ***	0.0137 ***	0.0175* **	0.0168 ***	0.0158 ***	0.179* **	0.023* **
	(0.0068)	(0.0053)	(0.0028)	(0.0026)	(0.0034)	(0.0034)	(0.0039)	(0.005)	(0.0047)
lnSize	0.3101* **	0.2850* **	0.2831 ***	0.3005 ***	0.3408* **	0.3672 ***	0.3936 ***	0.4336 ***	0.5510 ***
	(0.0337)	(0.0248)	(0.0258)	(0.0193)	(0.0238)	(0.0274)	(0.0265)	(0.0274)	(0.0368)
Export	0.00681 ***	0.00671 ***	0.0073 ***	0.0059 ***	0.0041* **	0.0045 ***	0.0038 ***	0.0046 ***	0.0049 **
	(0.002)	(0.0017)	(0.0014)	(0.0016)	(0.0013)	(0.0013)	(0.0013)	(0.0014)	(0.0020)
V	0.6375* **	0.7965* **	0.8310 ***	0.6358 ***	0.52671 ***	0.4905 ***	0.4307 ***	0.4046 **	0.3357 *
	(0.1471)	(0.1212)	(0.1218)	(0.1055)	(0.1119)	(0.1426)	(0.1394)	(0.1580)	(0.1717)
Constant term	6.8087* **	7.5564* **	7.7930 ***	7.520* **	6.997** *	6.7339 ***	6.4458 ***	6.0849 ***	4.5897 ***
Observation	(0.6165)	(0.4627)	(0.4811)	(0.3567)	(0.4276)	(0.5159)	(0.4828)	(0.5178)	(0.681)
	2287	2287	2287	2287	2287	2287	2287	2287	2287
Pseudo R	0.2112	0.2103	0.2122	0.2135	0.2214	0.2293	0.2419	0.2631	0.3040

The standard deviation is indicated in parentheses, and *, **, and *** indicate the significance levels of 10%, 5%, and 1%.

3. Transformation for Traditional Retail Companies

The public have known that the traditional retail industry needs transformation, but, before discussing how to transform, we need to be reminded of the challenge that we faced. Firstly, there is a lack of integration of big data from different sources. Big data comes in various forms. Most of the data stored by retail enterprises are unstructured data such as text, images and web pages. However, this information comes from a wide range of sources. Because of the independence of different network media, it is difficult for the retail industry to effectively integrate data from different channels to provide data support for retailers to make effective marketing decisions.

Secondly, the efficiency of mining big data is low. Enterprises need to receive massive data information every day. In order to discover the law of customer demand in big data, they need to timely dig into massive data. However, the current equipment and technology make it impossible for retail enterprises to effectively collect data.

What such an industry should do is to enhance the integration and value density of big data. Big data has a multi-layered structure and can take on various forms and types. Therefore, in the era of big data, retail enterprises must solve the problem of the integration of data generated by different platforms. Integrate and manage the data of different network platforms, mine the data conducive to enterprises, and provide a guarantee for market decision-making. In addition to this, looking for the correlation between them is also very essential. With the demand of consumers more and more personalized, the traditional marketing model has been difficult to adapt to market changes. When the correlation is strong, it can predict the consumption habits and preferences of customers according to their commodity list. Then they can sell the commodities or services that they are interested in. When the correlation is weak, even if the amount of data increases, favorable information cannot be mined from it. Therefore, in the era of big data, it is particularly important to mine the correlation between data. After we collect and analyze the data, we need to improve digital operations. At present, most of the e-commerce enterprises after the transformation still adopt the traditional marketing model, just simply shifting the sales model from offline physical stores to the Internet. At present, in the digital era, what e-commerce needs to do is to upgrade enterprise digital technology, and use relevant means of digital technology to establish contact points and necessary contacts with target customers. They also need to establish an operating system belonging to enterprise products and services with customer expansion, retention and transformation [4].

To stable online shopping, we also need to establish a sound logistics system and provide a stable supply chain. In order to have a better future, training of digital talents is necessary.

Emerging technologies such as big data are widely used in e-commerce enterprises. Enterprises can accurately analyze current consumer preferences, then design, produce and sell products based on a series of data. However, for such a large amount of data information, technical talent is indispensable. Therefore, the top priority for cross-border e-commerce enterprises is to cultivate a group of digital technical talents. Enterprises can organize regular staff training and contact some universities to recruit outstanding digital talents [4].

Finally, after the end of the new crown epidemic, people will pay more attention to health, medical treatment, and outdoor products. Thus fashion, and healthcare products will be favored by the majority of users. Cross-border e-commerce can carry out reasonable product structure optimization. Cross-border e-commerce companies need to communicate with manufacturers and suppliers as soon as possible and timely develop reasonable inventory and marketing strategies to ensure capital turnover. Well-capitalized cross-border e-commerce companies should start expanding their business abroad. In the current situation of a small number of orders, it is advisable to send goods and products to overseas warehouses in advance. In terms of manpower and operation, it is better to save money to overcome difficulties which are brought by the pandemics [5].

4. Conclusion

This paper discusses the transformation of the traditional retail industry behind the era of big data. The result turns out to be that it must transform for the reason mainly that big data will bring great benefit to this industry. And the traditional retail industry may not be able to suffer from the economic system if they do not transform. Also, such industry can transform in several ways that are nearly all about how to analyze and use the information that provides by big data. This paper still has some defects in whether the methods provided is functional for all situation. Reliability can be enhanced by collecting more data by doing more experiments and surveys in different situations. Hoping future studies can focus on finding some ways to guarantee the security of the company when they enjoy the benefits brought by big data.

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