

Empirical Study on the Impact of E-commerce Market Characteristics on Product Innovation

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Abstract: With the continuous development of e-commerce, its transaction environment has realized interconnection and interoperability, and the transaction boundary has gradually been blurred. Product innovation of e-commerce enterprises can help enterprises to enhance economic benefits and create customer value based on their value theory, but it is easy to make the effect of product innovation unsatisfactory because of the influence of market environment factors. With the development of information technology, the competition in e-commerce market is becoming more and more fierce, and it also has a great impact on the innovation and development of market products. In the traditional market environment, the information characteristics of the market will have a significant impact on product innovation. E-commerce companies can use product innovation to enhance and create customer value. However, under the influence of the e-commerce environment, product innovation of e-commerce enterprises will be affected. This paper studies the impact of e-commerce market characteristics on product innovation, and thus effectively enhances corporate performance, and further promotes the development of the e-commerce market.

1. Introduction

Product innovation can help e-commerce enterprises to create customer value, but due to rapid changes in the market environment, the product innovation of e-commerce enterprises has been affected [1]. Based on the value theory, e-commerce enterprises can add and create new value for customers and themselves through product innovation, so this value creation method is different from that in the traditional market. With the aid of e-commerce channels, e-commerce enterprises can obtain more extensive market information to help enterprises understand customer needs, find opportunities in competition and promote product innovation [2]. E-commerce has changed people's traditional way of life and leisure, and has had a significant impact on the whole society, especially on the innovation of enterprise products and the improvement of performance. E-commerce is also playing an increasingly important role. In such an environment, the impact of e-commerce market characteristics on product innovation will show more differences [3]. The trading environment of e-commerce is online rather than offline, so the impact of market characteristics of e-commerce on product innovation will be inconsistent. In the traditional market environment, the information characteristics of the market will have a significant impact on product innovation. The most basic need to have a comprehensive understanding of the characteristics of the e-commerce market can further promote the impact of the e-commerce market on product innovation.

E-commerce companies can use product innovation to enhance customer value, but there are always differences between them and traditional markets. E-commerce enterprises will face far more competitiveness in the e-commerce market than traditional markets. Scale markets and alternative products are very prone to appear, resulting in too many unknowns in the value-added and upgradeable performance of e-commerce companies. 4]. E-commerce enterprises have become more in-depth and extensive in the acquisition of market information. Under the interconnected network, competition among e-commerce companies will become increasingly fierce [5]. E-commerce enterprises have greater pressure when the competition intensity is large. Although they can actively innovate, they will also enable some enterprises to make imitations for the benefit, and thus reduce the value of innovative products [6]. E-commerce companies need to conduct an in-depth study of this impact and its internal differences, and then propose targeted and more

rational product innovation strategies based on this analysis. The homogenization tendency of products has increased and more alternatives have emerged [7]. The market information and competition intensity in e-commerce enterprises have a serious impact on the results of product innovation. Therefore, we need to pay attention to research and explore whether it can bring beneficial effects to the performance of e-commerce enterprises.

2. Analysis of Market Characteristics of E-commerce

2.1 Feature Classification

Due to the different products required by different customers, enterprise products should also be innovated to meet customer needs. In order to improve sales performance, e-commerce enterprises must create products suitable for the market. For the market competitiveness of enterprises, product innovation is the most powerful weapon for enterprises to enhance their competitiveness, so in turn enterprises can find their own weaknesses from the proportion of market share. As the operation in the e-commerce platform is a virtual business, strict measures are needed in management. The most effective management is the evaluation and management of the business platform with the help of the enterprise's performance. Compared with the traditional market, the e-commerce market has its own characteristics. Under the influence of e-commerce market characteristics, there are certain changes in all aspects [8]. For market information, e-commerce enterprises can obtain wider and deeper information, and can use this information to provide basis for enterprise product innovation. Generally, when the number of new products is high and the frequency of new products is high, the sales performance of new products is mostly created by new products, and the sales proportion of new products in total sales is higher.

In different industries, they will show different market characteristics. For e-commerce, its market characteristics mainly include enterprise performance, enterprise competitiveness, market information and competition intensity. To measure the price competition between a company's homogeneous products and the average market price, the price competition between a company's products and the average market price can be simply written as follows:

$$\begin{aligned} c_1(t) &= c_{11} + (c_{1T} - c_{11}) \frac{t}{T} \\ c_2(t) &= c_{21} + (c_{2T} - c_{21}) \frac{t}{T} \end{aligned} \quad (1)$$

Initialize, calculate the connection weight and threshold, and assign any value:

$$I_i = \left[\sum_{j=1}^p \omega_j^m y_{ij}^m \right]^{1/m} \quad (2)$$

Provide input samples and expected output:

$$I_\omega \ddot{\delta} = F_r d - K_\omega \dot{\delta} - C_\omega \delta - K_1 e \delta \quad (3)$$

Table 1 The intensity of price competition for each impact factor

Impact factor	Action intensity
Security of Online Payment	0.142
User information security	0.072
Page style design	0.085
Page response speed	0.138
Convenience of communication	0.059
Integrity of goods received	0.107
Number of independent visits	0.233
Personalized service	0.721

Calculate the weight of price competition on each influencing factor. The weight value indicates the relative action intensity of each factor in the whole system. The calculated weight results are shown in Table 1.

2.2 Market Analysis

For e-commerce, the way to evaluate the performance of enterprises will be different from that of traditional industries. In the process of information technology development and change, the emergence of e-commerce has changed people's lives, but also changed people's consumption concept, online shopping has become a part of people's lives. Because of the different needs of major consumers, enterprises have a greater space for innovation, but some competing enterprises will find a large number of imitations or substitutes in order to find new innovation trends, which will reduce market share and profit margin. In order to standardize the business behavior of enterprises and promote the healthy development of e-commerce, e-commerce platform will evaluate the performance of enterprises. The e-commerce market is a huge system network. With the promotion of information technology, the e-commerce market is getting richer and richer in information. The competition among e-commerce enterprises is also becoming more and more fierce. The competition among enterprises is mainly reflected in the leading degree of product innovation and enterprise cost [9]. E-commerce platform uses performance evaluation to influence the popularity of enterprises on the platform, and the final results of the performance will also have an impact on the expansion of enterprise customer groups. As for the change of product innovation tendency, its innovation tendency will change according to the following situation of competitors, the demand situation of customers and the conformity psychology of customers, thus its competition intensity will be intensified.

3. The Influence of E-commerce Market Characteristics on Product Innovation

Only by continuously enriching their product lines and accelerating the satisfaction of consumers' demands can China's e-commerce enterprises gain advantages in market competition and improve their competitive efficiency. Under the influence of e-commerce market, product innovation is an important way for enterprises to win the market, and it is also an effective method for e-commerce enterprises to occupy an important position in the e-commerce platform. E-commerce enterprises rely on the Internet as the transaction basis, and all transaction processes are moved from offline to online. The e-commerce market can feed back all kinds of information, and businesses can make decisions according to the market development trend. Product innovation includes many aspects, including both technological innovation and design innovation. The most basic thing is to make new scientific and technological changes on the basis of existing products [10]. To a certain extent, the more market information China's e-commerce enterprises obtain, the more fully they can grasp the supply and demand situation and product characteristics in the market. As far as the e-commerce market is concerned, the faster the speed of product innovation is, the better it will be for improving the quantity of product marketing, thus improving the performance of enterprises.

Table 2 Performance indicator structure parameter estimation and significance test

Path description	t value	Path coefficient
Market Learning Ability → Affect Performance	3.56	1.53
Marketing Ability → Marketing Performance	3.35	1.58
Customer Management Ability → Marketing Performance	4.48	1.46

With the increasing intensity of competition in China's electronic market, China's e-commerce enterprises can only enhance their position in the market competition by carrying out differentiated product reforms in the continuous innovation and development. When the significance level is low,

the customer management ability has a relatively large impact on the marketing performance. However, the other two sub-indicators market learning ability and marketing promotion ability have significant impact on marketing performance, but to a lesser extent. For example, Table 2 shows the estimation and significance test of structural parameters of performance indicators.

The risk degree of this project can be obtained by risk evaluation simulation of sample data with the model. The simulation results are basically consistent with the recommended values, which also shows that the model has higher accuracy. The recommended value and evaluation value data of sample risk are shown in Table 3.

Table 3 Recommended values and evaluation data for sample risk

Sample	1	2	3	4	5
Recommended value	3.27	3.06	3.67	3.85	3.26
Evaluation value	3.39	3.21	4.33	3.95	3.72

Based on the Internet environment, the enterprise's product innovation needs strong market competitiveness as a guarantee, and in turn, the improvement of market competitiveness will also promote the enterprise to realize the goal of product innovation. On the one hand, it can enable enterprises not to rely excessively on certain innovative products for a long time, so that all e-commerce enterprises can maintain innovation, and sales and profits can also maintain or grow well. The existence time of network information is relatively short, which is an opportunistic information. If it is detected relatively late, it will miss the tide of development. In the fierce competition of e-commerce market and the process of market information acquisition, only through product innovation as an intermediary variable, can China's e-commerce enterprises improve their business performance. For e-commerce enterprises, the standard of product innovation should be the expected value of consumers. Consumer expectations can provide direction for product innovation. The faster the speed of product innovation, the more it will be used, and the higher the performance of e-commerce enterprises in the end. If an enterprise wants to obtain lasting market competitiveness, it must continue to produce and feed back the positive effect of product innovation to the improvement of enterprise performance, and then recycle this positive effect in the whole market characteristics system.

4. Conclusion

In the process of changing market structure, e-commerce market has become an important mode of economic market. E-commerce has greatly changed people's consumption concepts and ways, and has given people a new understanding of e-commerce. The continuous innovation of e-commerce products makes the development of e-commerce market sustainable. Whether from the development needs of e-commerce enterprises themselves, or from the market and customer needs, product innovation has its objectivity and inevitability. In the process of competition, China's e-commerce enterprises should strengthen the promotion of product innovation ability and establish the brand and image of their products. For the market competitiveness of enterprises, product innovation is the most important weapon to enhance their competitiveness, so the level of market competitiveness of enterprises reflects their demand for product innovation. China's e-commerce enterprises should continue to make use of the development background of big data, strengthen the extensive application of information collection and data analysis, and enhance their market information mining capabilities. Under the guidance of the characteristics of e-commerce market, only by innovating products can the main body of an enterprise have a long-term development and foothold in the market and win market share.

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