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Research on the Impact of B2C E-commerce and Third Party Platform: An Empirical Analysis based on Factor Analysis

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Abstract

With the acceleration of the social information process, the number of small and medium enterprises that use e-commerce platform has increased. Through the application of the third party e-commerce platform, it is a great convenience for enterprises to purchase the raw materials and product marketing, reduce the cost of inventory, and shorten the supply chain process. At the same time, with the addition of a large number of similar enterprises, the information sharing ability and competitive advantage of the third party e-commerce platform are further increased. In this paper, we test the influence factors that affect third party e-commerce platform, and analyze three main factors as enterprise external factors, enterprise internal factors and technical factor. At the same time, we put forward policy and technical advice.

Keywords: *Third-party platform; E-commerce; Factor analysis; Performance evaluation*

1. Introduction

Since the advent of electronic commerce, has received much attention, especially in recent years, the rapid development of social information process, the electronic commerce process has been rapid development of small and medium enterprises. According to China's electronic commerce research small and medium data testing show that by 2014, China's B2B e-commerce transaction size of up to 7 trillion RMB, an increase of 19.7%, while the number of small and medium enterprises in the domestic use of the third party e-commerce platform has reached 18 million[1]. For a long time, small and medium enterprises in the processing of international trade processes or other business, due to the size, capital and management and other reasons, has been unable to establish their own e-commerce system, greatly reducing the process and speed of the use of e-commerce enterprises[2]. With the development of the times, the third party e-commerce platform, through the application of the third party e-commerce platform, greatly facilitates the enterprise's raw material procurement and product marketing, reduce enterprise's inventory cost, shorten the supply chain, so more and more enterprises to join the third party e-commerce platform, through the third party E-commerce platform to make up for the lack of enterprise self built platform, shorten the gap between small and medium enterprises and large enterprises. At the same time, the addition of a large number of similar enterprises, and further increase the information sharing capacity, visibility, scale economy and competitive advantage of the third party e-commerce platform.

The third party e-commerce platform to improve the competitiveness of enterprises mainly in the following aspects: first, to facilitate the enterprise to understand the world market demand, help to improve the agility and adaptability of enterprise production, and

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promote the integration of the company's business with all over the world, can form a more effective economic scale.

Through the development of the third party B2B platform, it can improve the influence and marketing ability of the virtual enterprise cluster effectively, and the three should speed up the information construction of the enterprise. The role of this area is mainly through the strengthening of the enterprise information process to achieve. The application of the third party e-commerce platform in the international trade of our country has got the rapid development, but the level is very limited, especially in our country such a small and medium enterprises accounted for more than 90% of the total number of enterprises, small and medium enterprises to carry out the proportion of e-commerce is still low [3]. Why small and medium enterprises to adopt the third party e-commerce platform in the process is relatively slow what is the cause of the third party e-commerce platform has been widely used on the other hand, has adopted the third party e-commerce platform for small and medium enterprises, although a few gains, but the effectiveness has not been fully played. What factors affect the successful implementation of the third party e-commerce platform, summarized domestic and foreign research results, for small and medium enterprises to use third party e-commerce platform, the impact of factors, is a separate from small and medium enterprises themselves, to find out the use of third party e-commerce platform, one is from the third party e-commerce platform for SMEs to study the choice of small and medium enterprises. The author from the small and medium-sized enterprise business process analysis, find out the third party platform can optimize the enterprise information flow, put forward to take into account the enterprise itself, the external environment and the third party e-commerce platform technology service level three aspects of the influence factors.

2. Literature Review

2.1. E-Commerce Model

Electronic commerce can be distinguished from broad and narrow sense, the broad sense of electronic commerce not only emphasizes the use of Internet technology to carry out business activities, trading and information access, pay more attention to the use of e-commerce in business management, office automation and business management of various fields. Based on Internet information technology, the third party e-commerce platform is a branch of e-commerce model, which provides communication and information acquisition, product delivery and capital transfer between enterprises and enterprises, enterprises and consumers, so the third part of this paper is the narrow sense of electronic commerce.

From the previous literature, we found that the classification of the electronic business model can be divided into the following categories: transaction object, transaction process, and network type and profit model. In accordance with the electronic business process can be divided into direct e-commerce and e-commerce. Indirect electronic business mainly refers to the electronic commerce of tangible goods, because of the existence of physical products, also cannot do without the help of the traditional logistics channels [4]. Especially for small and medium enterprises in international trade, the use of electronic orders and payment, cross-border trade information exchange, the trade plays a key role. Because of its own characteristics, these products cannot be restricted by the traditional logistics industry, which can be fully exploited to explore the potential of the global market for international trade. Third: according to the different network types. There are three modes of EDI, Internet and Intranet, and these three models are not mutually separated, for the strength of the enterprise may also use one or more than three modes of two models. Fourth: according to the profit pattern division [5]. Through

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the summary and comparison of the electronic business model, we find that the choice of the electronic business model is decided by the special social environment, the information technology level and the enterprise itself. In the present situation, the paper selects the most representative third party e-commerce platform.

2.2. Third Party E-Commerce Platform

The detailed division of the electronic commerce mode of the platform is sold to the consulting company, which is divided into the electronic commerce platform mode, the buyer's control mode and the third party control mode based on the platform of electronic commerce[6]. The so-called third party e-commerce platform model refers to the virtual network platform by the professional e-commerce platform developers or operators to serve the business or consumers. Third party e-commerce platform mode through the high level of information service quality, beautiful website interface, professional website technology, advanced network influence constitutes a strong advantage of the third party e-commerce platform. So as to attract more buyers and sellers to participate in this platform, the use of the scale effect of information, relying on advanced service technology for the sale of the smooth transaction to provide supporting services business model[7].

Service in the enterprise network construction of e-commerce third party e-commerce platform, enterprise due to its own technical level, personnel quality, cost constraints, in the pursuit of product transactions, information release, want to increase the company's propaganda way, influence, will consider the establishment of enterprise website, so the service in the enterprise network construction of the third party electronic commerce platform [8]. At present, foreign trade enterprises are more familiar with the mode of ASP (application service provider) outsourcing, rent public service platform and virtual host mode three modes for foreign trade enterprises to choose. ASP services are mainly provided by enterprises operating hardware, software and management processes and internal resource management, the most important is to assume the maintenance of late software and hardware ASP, management and update[9]. For the pursuit of standardization, standardization of services for foreign trade enterprises in particular, in addition to the requirements of e-commerce to more urgent business, application service providers to provide management and maintenance services can allow companies to focus on their core business, reducing the investment in human and material resources. Compared with ASP outsourcing, rent public service platform and virtual host mode more emphasis on enterprise to establish its own technical level of website construction, service providers to hire public service providers to provide technical support for the production and development of Web sites, but companies need to manage and maintain products, customers, orders and other information[10]. This model is suitable for the enterprise which has a lack of network construction and the strength is weak.

3. Model Design

3.1. Factor Analysis

Factor analysis is a multivariate statistical analysis method, which is a multivariate statistical analysis method, which is used to reduce the dimension of the high dimensional variable space, which is the principle of reducing the data loss. The factor analysis method is used to study the relationship of the sample correlation matrix, and some of the related variables or samples can be reduced to a few of the comprehensive factors. The score on each factor of the sample reflects

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the strength of the sample on the factor, the higher the score, the more the strength. The total score of the sample reflects the comprehensive strength of the sample, and can be sorted according to the weight of the sample, which is based on the comprehensive strength of the sample.

The basic idea of factor analysis is to put more closely related variables into the same category, and the correlation between different classes of variables is lower. In the same category, it is possible to imagine that the influence of a common factor is highly relevant to each other, and that the common factor is also called a public factor, which is potentially and cannot be observed. Factor analysis reflects the idea of reducing dimension, which is not only easy to extract the features of easy interpretation, but also reduces the complexity of the variables which need to be analyzed.

With n samples, the N has a strong correlation, and the effect of P on the sample is standardized, and the mean value of the treatment is 0, the difference is 1, and the standard is F1, F2, ... ,Fm (m<p) is a common factor. Observable random variable:

$$X = (X_1, X_2, \cdots, X_p)$$

Non observable random variable is:

$$F = (F_1, F_2, \cdots, F_p)$$

β and F are independent of each other, and the E (β) =0, the covariance matrix of the β as:

$$\operatorname{cov}(\beta) = \sum_{\beta} = \begin{bmatrix} \delta_{11}^2 & & & 0 \\ & \delta_{22}^2 & & \\ & & \cdots & \\ 0 & & & \delta_{nn}^2 \end{bmatrix}$$

Deformation model for:

$$\begin{cases} X_1 = \alpha_{11}F_1 + \alpha_{12}F_2 + \cdots \alpha_{1m}F_m + \beta_1 \\ X_2 = \alpha_{21}F_1 + \alpha_{22}F_2 + \cdots \alpha_{2m}F_m + \beta_2 \\ \cdots \\ X_p = \alpha_{p1}F_1 + \alpha_{p2}F_2 + \cdots \alpha_{pm}F_m + \beta_p \end{cases}$$

In the form of matrix representation as X =AF +β, we call the factor model as:

$$A = \begin{bmatrix} \alpha_{11} & \alpha_{12} & \cdots & \alpha_{1m} \\ \alpha_{21} & \alpha_{22} & \cdots & \alpha_{2m} \\ \vdots & \vdots & & \vdots \\ \alpha_{p1} & \alpha_{p2} & \cdots & \alpha_{pm} \end{bmatrix}$$

Factor analysis of influencing factors: the common degree of the above mentioned above can be judged by the public factor F1, F2,... , the relationship between Fm and the original variable is similar to that of a common factor, X1, X2,... , Xp.

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3.2. Index Selection

Based on the above analysis, we put forward the influence factors of the third party e-commerce platform based on the internal and external application of the enterprise. It can be seen that the proportion of small and medium enterprises in our country is still low, so we should make clear the main impact on the third party e-commerce platform which is the main reason for the slow development of the third party e-commerce platform.

a) Enterprise external factors: the impact of small and medium enterprises to use the third party e-commerce platform outside factors mainly from outside the pressure and the external environment provided by the third party platform. From partners including consumer pressure, third party e-commerce platform in the optimization of upstream suppliers and downstream consumer information flow, highlighting the performance in promoting the information sharing and communication between partners, the ability to communicate with consumers, especially now customers face a wide range of choices, consumers in the pursuit of product characteristics, quality, but also hope that the user experience and service value to get the support of the enterprise, which constitutes a pressure from customers.

b) Enterprise internal factors: in the measurement of small and medium enterprises and large enterprises, the dividing line, usually with the size of the organization and financial strength to divide, which is due to the size of the enterprise organization and financial strength, will affect the technology, talent, capital resources, and then affect the third party E-commerce platform. In the analysis of enterprise use third party e-commerce platform and not the use of third party e-commerce platform need to enterprise strategic planning, this is because the enterprise in the use of third party e-commerce platform, more should be from the strategic height to third party e-commerce platform for implementation and operation, no clear strategic management ideas, enterprises will not only face the third party e-commerce platform after the failure of high technology investment costs, even in the use of third party e-commerce platform, also cannot get a good income. In the enterprise internal, reflect the technical level of the enterprise is often used to measure the enterprise's technical ability. In support of personnel, including the support of the manager, the company has a technical personnel, information based and employee recognition.

c) Technical factor: third party e-commerce platform prices in the impact of business use third party e-commerce platform, and the third party e-commerce platform price level and web services, web site technology and the influence of the site is not divided, these factors constitute the third party e-commerce platform price factors. Web service level includes core products, enterprise basic information, online payment and online payment and online customer exchange, customer privacy protection, logistics and distribution. Web site technical level is a comprehensive range, including the main site stability, site security, and the ability to search for the convenience of diversity and reflect speed, *etc*.

4. Empirical Analysis

4.1. Data Source

The purpose of the study is to determine the impact factors of the third party e-commerce platform, so, in the determination of the object, the main choice has been used or are using the third party e-commerce platform for online promotion and sales of small

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and medium enterprises, they feel most of the third party e-commerce platform to reflect the status quo. In the survey, 85% e-commerce platform has been used in the third party e-commerce platform for small and medium enterprises, which are not actually used to buy or sell small businesses, these enterprises are the third party e-commerce platform for the future use of 1 party e-commerce platform for SMEs, so understand their concerns and perceptions of the third party e-commerce platform, so that the number of small and medium-sized enterprises, although the number of small and medium enterprises is divided into small and medium-sized enterprises. As shown in Table 1.

Table 1. Enterprise Size Distribution

Enterprise scale	number	Percent	Cumulative percentage
Less than 100	201	34%	34%
100-300 people	277	47%	47%
300-500 people	59	10%	10%
More than 500	53	9%	100%

4.2. Reliability Analysis

The problem of questionnaire is expressed in the form of quantity, and the rationality of the weave is related to the reliability and availability of the evaluation results. Therefore, a method is needed to investigate the validity and credibility of the questionnaire. The reliability analysis of the questionnaire mainly includes the internal reliability analysis and external reliability analysis, the method of the reliability analysis has many kinds, the most common Alpha reliability and half reliability, *etc*.. In this paper, we use the most common Alpha reliability coefficient method, if the coefficient meet the requirements, it can be seen as the amount of the table to meet the requirements of internal consistency. The reliability coefficient of the scale is between 0-1, and if the reliability coefficient of 0.8-0.9 is satisfied, the reliability coefficient is, the reliability coefficient is 0.7, and the reliability of the questionnaire is SPSS.

Table 2. Reliability Analysis

Cronbach's Alpha	Standardized Items	N of Items
0.827681	0.8279264	14

Table 3. Potential Variable Reliability Analysis

	Scale Mean	Scale Variance	Corrected Item	SMC	Cronbach's Alpha
Transaction security	31.56	52.744	.265	.211	.828
credit system	31.19	49.908	.436	.306	.818
Customer pressure	31.44	48.744	.419	.292	.820
Customer demand	31.57	49.754	.422	.317	.819
Employee skills	31.50	51.444	.328	.253	.825
Enterprise support	31.50	48.612	.531	.406	.812
information foundation	31.49	50.612	.345	.233	.825
economic support	31.50	48.230	.529	.425	.812
Enterprise fit	31.51	48.545	.498	.299	.814
Website feedback	31.54	48.790	.534	.438	.812
Website security	31.78	48.647	.551	.556	.811
Site visits	31.84	49.886	.473	.503	.816

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4.3. KMO Test

KMO value is a ratio between the correlation coefficient and partial correlation coefficient, which is between 1 and 0. KMO value is bigger, the more common factors among the variables, the more suitable for factor analysis, KMO value is smaller, the factor analysis more adverse. The variables that are too large or too small to be removed and the other variables are too large or too small to increase the value of KMO, which are generally considered to be more suitable for the analysis of KMO test values than 0.6. Bartlett is the test of a number of variables is not relevant, if the overall correlation matrix is the unit matrix, it is assumed that these variables are not suitable for factor analysis. Next we use SPSS software to sample survey data for Bartlett and KMO test, the results are shown in the following table. As can be seen from table 0.820, the KMO value as shown in Table 4, the Bartlett test is passed, which indicates that the data is suitable for factor analysis.

Table 4. KMO and Bartlett Test

Kaiser-Meyer-Olkin		0.820
Bartlett test	Approximate chi-square	377.873
	df	91
	Sig.	0.000

4.4. Factor Analysis

Through the factor analysis, the main components of the information extracted from the original variables were found to have nearly 80% more information than the employee's skills and website. The information of the original data is extracted by the method. As can be seen from the table, the public factor of the explanatory power of each of the original variables is strong. We use factor analysis in principal component analysis of the original data matrix extraction common factor, usually to take m the cumulative variance contribution rate reached more than 85 percent principle can be selected m public factor to represent the original index without much loss of information. According to software analysis, the cumulative variance contribution table, as shown in Table 5.

Table 5. Variance Contribution of Common Factors

Ingredients	Initial eigenvalues			Extracting square and loading			Rotating square and loading		
	Total	Vari.	Cum.	Total	Vari.	Cum.	Total	Vari.	Cum.
1	4.914	35.102	35.102	4.914	35.102	35.102	3.551	25.368	25.368
2	2.246	16.044	51.146	2.246	16.044	51.146	1.603	11.451	36.819
3	1.239	8.850	59.996	1.239	8.850	59.996	1.577	11.267	48.086
4	1.059	7.562	67.558	1.059	7.562	67.558	1.465	10.464	58.550
5	.989	7.066	74.624	.989	7.066	74.624	1.304	9.315	67.865
6	.883	6.307	80.930	.883	6.307	80.930	1.287	9.193	77.058
7	.734	5.243	86.173	.734	5.243	86.173	1.276	9.115	86.173
8	.4	2.9	89.						

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	09	23	096						
9	.331	2.365	91.461						
10	.322	2.301	93.762						
11	.268	1.915	95.677						
12	.240	1.714	97.391						

Variance Explained Total table shows that the total variance of the original variables is explained by 7 common factors. The default retention feature of SPSS is greater than 1, and the total variance contribution rate of the first 7 is 86.173%, so the 7 public factors can be found to reflect the original index. In order to give a clear explanation of the factors of the public factor, the factor load matrix was obtained by orthogonal rotation of the initial factor. Component Matrix Rotated is the factor loading matrix; it can be found that the rotation factor load matrix has changed a lot, which is shown in Table 6.

Table 6. Rotated Component Matrix

	f1	f2	f3	f4	f5	f6	f7
X1	.047	.243	.091	.196	-.040	.023	.023
X2	.145	.158	.026	.895	.041	.071	.169
X3	.241	.250	.651	.301	-.050	.044	-.370
X4	.112	.082	.850	-.030	.122	.168	.255
X5	-.017	.701	.010	.024	.210	.153	.330
X6	.184	.774	.230	.206	.113	.108	.003
X7	.095	.223	.041	.057	.917	.069	-.029
X8	.074	.085	.285	.518	.463	.391	.065
X9	.164	.232	.151	.108	.090	.881	.014
X10	.634	-.137	.037	.186	.140	.346	.293
X11	.802	-.069	.097	.160	-.008	.169	.104
X12	.796	.235	-.162	.096	-.018	.091	-.137

According to the practical economic meaning of each index, we give each public factor to take a suitable economic name. As can be seen from Table 4, the public factor F1 focused on the site service quality, website technology, website influence, *etc*., so we named the site F1 technology level factor. In the public factor X5, F2 and X6 have a higher factor loading, which reflects the employee skills and enterprise support, so we named F2 as the organization security factor. In the public factor X3, F3 and X4 have a higher factor loading, the response of the customer pressure and customer demand, so we named F3 customer demand factor. In the public factor X2, F4 has a higher factor load, reflects the external credit situation, so we named the F4 outside the credit factor. In the public factor X7, F5 has a higher factor loading, the proportion of the enterprise's information infrastructure, so we named F5 enterprise information level factor. In the public factor X8, F6 and x9 have a high factor loading, the reaction of the enterprise economic support and enterprise suitable for the proportion, so we named the F6 enterprise support factor. In the public factor x1, F7 has a higher factor loading, the proportion of the security of the transaction, so we call the F7 security factor.

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5. Conclusion

This article is in the context of e-commerce is being more and more companies accept and adopt, select the most representative, the most popular e-commerce mode - third party e-commerce platform model. Through theoretical analysis and empirical analysis, we find out the influencing factors of the third party e-commerce platform, and verify the importance of these factors by empirical analysis, and provide suggestions for enterprises in the choice of third party e-commerce platform. This paper analyzes the problems in the use of small and medium enterprises in the third platform and the external environment, and puts forward the countermeasures and suggestions for the government level, enterprise level and platform technology. Platform technology level of countermeasures and suggestions are proposed for small and medium enterprises in the choice of third party e-commerce platform should focus on information quality, service level, diversification needs, transaction security and other factors. Enterprise level countermeasures and suggestions include strategic planning, personnel training, a clear corporate goals and the use of the platform for the enterprise is suitable for the third party e-commerce platform, *etc*.

The development and growth of the forward C2C is changed to B2B, and the trade between enterprises and enterprises is mainly due to the difference in the size of the transaction, and the expansion of consumer online transaction volume, the C2C platform has demonstrated the characteristics of B2B platform. B2B and B2C convergence is to narrow the distance between businesses and customers, shorten the transaction process, improve the efficiency of production, circulation, sales, and reduce enterprise costs. Third party e-commerce platform since its emergence, due to its huge information advantages, has been committed to provide quality information services, but now, with the social credit system, the transaction safety regulations, especially banks, government departments to actively promote the third party e-commerce platform services from information services to online trading services.

References

[1] E. H. Sinem and Z. Kabadayı, "Innovation Orientation, Market Orientation and e-Loyalty: Evidence from Turkish e-Commerce Customers", Procedia - Social and Behavioral Sciences, vol. 99, **(2013)**, pp. 509-516.
[2] S. Manjit, and V. Kristine, "Social Commerce: A Contingency Framework for Assessing Marketing Potential", Journal of Interactive Marketing, vol. 27, **(2013)**, pp. 311-323.
[3] K. Grant and D. Edgar, "Risky business: Perceptions of e-business risk by UK small and medium sized enterprises (SMEs)", International Journal of Information Management, vol. 34, no. 2, **(2014)**, pp. 99-122.
[4] M. Savrul, "The Potential of E-commerce for SMEs in a Globalizing Business Environment", Procedia - Social and Behavioral Sciences, vol. 150, **(2014)**, pp. 35-45.
[5] S. Deniss, "Impact of e-environment on SMEs Business Development", Procedia - Social and Behavioral Sciences, vol. 156, **(2014)**, pp. 409-413.
[6] M. Shoki, L. Yun, and N. Zakuan, "Examining Dimensions of Electronic Service Quality for Internet Banking Services", Procedia - Social and Behavioral Sciences, vol. 65, **(2012)**, pp. 854-859.
[7] S. Djelassi and I. Decoopman, "Customers' participation in product development through crowd sourcing: Issues and implications", Industrial Marketing Management, vol. 42, no. 5, **(2013)**, pp. 683-692.
[8] H. Gebauer, M. Paiola and B. Edvardsson, "A capability perspective on service business development in small and medium-sized suppliers", Scandinavian Journal of Management, vol. 28, no. 4, **(2012)**, pp. 321-339.
[9] I. Janita and W. Chong, "Barriers of B2B e-Business Adoption in Indonesian SMEs: A Literature Analysis", Procedia Computer Science, vol. 17, **(2013)**, pp. 571-578.
[10] A. D. Zaridis and T. Dimosthenis, "Entrepreneurship and SME's Organizational Structure. Elements of a Successful Business", Procedia - Social and Behavioral Sciences, vol. 148, **(2014)**, pp. 463-467.

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