2528-9705

Örgütsel Davranış Araştırmaları Dergisi
Journal Of Organizational Behavior Research
Cilt / Vol.: 8, Sayı / Is.: S, Yıl/Year: 2023, Kod/ID: 23S0-988

THE IMPACT OF INFORMATION TECHNOLOGY ON PRODUCTIVITY AND TIMELY DELIVERY OF PRODUCTS TO CUSTOMERS

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ABSTRACT

E-commerce is expanding widely among people, and of course, some people still have serious problems in benefiting from this possibility and are unable to use these facilities due to the low speed of the Internet or the absence of Internet in their areas. The present research has been conducted qualitatively through telephone and face-to-face interviews with 230 personnel of Iran Khodro dealerships in the southeast region, and has examined the impact of e-commerce to provide better services to their customers. According to the obtained results, the value of the test statistic is 20.83 and greater than 1.96, the upper and lower limits of the mean are of the same sign and positive, and the significance level is equal to 0.000, which is less than 0.05. According to this evidence, it can be said that the null hypothesis is rejected and the research hypothesis is confirmed. The null hypothesis was defined as the lack of effect of information technology on productivity and timely delivery of products to customers, and the research hypothesis was defined as the effect of information technology on productivity and timely delivery of products to customers. The significant effect of information technology on productivity and timely delivery of products to customers is confirmed. Finally, we can conclude that the average number of comments is 3.74, which is higher than the hypothetical average of 3. This means that the employees have considered the relationship between these two variables to be high.

Keywords: *Electronic business, Information technology, On-time delivery, Iran Khodro, Productivity.*

INTRODUCTION

With the expansion and progress of science, small and large companies around the world have tried to take a share of this reality and adapt themselves to this research. In today's market, where customers undoubtedly have the first and last word, using technology and e-commerce is the most likely and best option to gain more success and progress. With the expansion of e-commerce, fewer customers visit companies and stores to meet their needs and obtain information about them physically and in person, and obtain a large percentage of their information through the Internet and mobile phones. The present research was conducted qualitatively and through telephone interviews with managers and employees of sales and after-sales services in Iran Khodro dealerships in the southeast region of the country, and the impact of e-commerce on productivity and on-time delivery and providing better services to their customers. Examining the extent to which Iran Khodro dealerships in the southeast region use e-commerce in their organization and have facilitated the customer's path to get services and buy cars. In this regard, Iran Khodro Industrial Group with customer address. ikco. ir (customer

desk) Esale. ikco. ir (online car sales) isaco. ir (after-sales service website) and Iran Khodro's news site called ikco press, to what extent have they been able to be effective in the productivity and timely delivery of cars and services to customers in Iran Khodro dealerships.

Business and business methods are one of the most important areas that were quickly and severely affected by the use of new information and communication technologies and the Internet. Many of the traditional methods of earning money have changed and many new methods and values have also appeared. A business model is a method of doing business in such a way that the company can maintain itself and guarantee its survival, in other words, generate income.

Information technology has permeated many aspects of social and organizational life. In the dynamic and competitive market, organizations have reached such a level of need that they should determine how to allocate their costs and capital in the matter of information technology at high and strategic levels. But to be able to determine high levels of customization, it is necessary for the organization to determine its current status in the field of electronic readiness and a more precise definition in the field of electronic business and to determine the influencing factors in the growth and development of this approach according to the type Pay for your service (Ziroginis and Gilkas, 2007).

E-business is a broad concept that includes all aspects of using information technology in business and does not only include buying and selling. Rather, it includes creating coherence and integration in all business processes and communications inside and outside the organization (Rovelli, 2002).

This type of business, as one of the subsets of information and communication technology, has experienced high growth in the last decade. So the policy approach of most commercial institutions is to accept and apply e-business to enter the global markets and attract new, effective, and efficient customers in this direction. However, the application of electronic business in commercial activities requires attention to a series of endogenous and exogenous factors affecting it. So that the attention of commercial enterprises to these factors and planning for the optimal use of electronic business technology will guarantee the success of its exploitation, and also provide the basis for the growth of the user enterprises.

Theoretical Foundations and Research Background

E-business is the acquisition of customers and merchants for commercial exchanges through self-working transactions, exchanges, communications, and interactions through communication and computer technologies for economic goals that include inter-organizational systems, such as telephone, internet, e-mail, or internal computer networks to support online business transactions. So it can be said that the goal of this type of new business is to automate business transactions and workflow (Hanafizadeh, 2006).

A safe, flexible, and integrated approach to achieve value in different businesses by creating a combination of systems and processes that are based on core business activities while maintaining simplicity and using Internet technology (Pavik et al., 2007).

Turban (2002) considers electronic commerce to include buying and selling goods, services, and information through electronic tools such as the Internet.

According to Rapport and Jaworski (2001), electronic business is a technological exchange between departments (individuals or organizations) and electronic activities within and between organizations that facilitate such exchanges.

Finnegan and Hayes (2005) summarized the theories of Timmers, Tapscott, and Kaplan and a combination of the criteria provided by these three experts, five criteria of economic control, value chain integration, functional integration, business innovation, and sourcing. expressed as effective factors in choosing an electronic business model. In his article, Ng (2005) also identified the effective factors in the selection of electronic business models, including the size of the organization, the culture of electronic business in the company's environment, and understanding and recognition of business models. Electronic, the amount of resources required by the company, the type of target market of the company, the nature of the products, and the strategies of different levels of the organization.

Research Background

In this research, Shafii Nikabadi et al. (2008) identified different dimensions of innovation and divided them into four main factors: 1) development of information technology tools, 2) price competitiveness, 3) intensity of concentration in the industry (market share) and 4) Centralization and the degree of flexibility in divided tasks and evaluated their importance in the implementation of electronic business in parent companies in the automobile industry. With the survey conducted, only the case of centralization and the degree of flexibility in tasks was not recognized as an important factor in the implementation of e-business in parent companies in the automobile industry. Finally, the measurement of the known factors in Iran Khodro's parent company has been undertaken to evaluate the readiness of Iran Khodro in terms of the factors that create innovation in the implementation of electronic business.

In this research, Talebpour and Hekaranesh (2008) aimed to provide fuzzy models to investigate the interaction of factors and their effect on the growth of the use of e-business approach in the organization. For this purpose, to model these factors and their impact level, first by examining the previous research, the influencing factors in the development of the e-business approach were identified, and then by using the opinion of specialists and using the Delphi method, these factors were categorized. In the following, by using the FCM model, the guided graphic diagrams of the factors are drawn, and by using these diagrams, the cause and effect relationships between the mentioned concepts are presented in the nodes, and the network of relationships between the factors is analyzed and explained.

In this research, Rezvani and Rouhani (2013) have presented a new typology of electronic business models based on strategic reference points in small and medium-sized electronic businesses in Iran by reviewing the literature on the subject. For this purpose, 400 small and medium-sized electronic businesses in Iran were examined by an electronic questionnaire, and software was used to analyze the data and answer the research questions. The results showed that the focus of attention and the degree of control are effective strategic reference points in the selection of electronic business models in the mentioned typology.

In this research, Jajiha et al. (2008) aimed to identify the behavioral factors affecting the "acceptance of electronic commerce" by using Davis's technology acceptance model test and Eisen's theory of planned behavior, by managers of small and medium businesses in Tehran. In this research, the main focus is on behavioral intention, and actual behavior is not measured. To test the mentioned models, data was collected from 226 small and medium business managers, and then the models were tested using Laserl software. The results of Davis' technology acceptance model test showed that all relationships of this model are significant. Also, in Eisen's planned behavior model test, all relationships (except for the relationship between mental norm and behavioral tendency to accept or use electronic commerce) were found to be significant.

Hayes and Finnegan (2005) put different factors that create innovation in the implementation of e-business in four dimensions development of information technology tools, centralization and flexibility in tasks, intensity of competitive price, and intensity of concentration in the market (market share). The first case is related to the technological dimension of the organization, the second case is related to the internal factors of the organization, and the last two cases are related to the external environment of the organization.

Lal (2002) has conducted a study in India to evaluate the relationship between e-business and export. In this study, 51 commercial enterprises were divided into three groups: non-export, export, and only export, according to the indicators: electronic business methods; the level of skill of the labor force working in the companies, the technology used in the companies and the productivity of the labor force of the companies were investigated. In this research, he made export motivation a function of the above factors and reached the following conclusions: unlike non-exporting companies, companies that have an export approach use the network gateway method instead of the traditional OFF-LINE method in business transactions. The amount of sales of export-oriented companies is more than that of non-export companies, and in these companies, the amount of sales made by the network gate method is much higher than other methods. The degree of expertise and labor productivity in export-oriented companies is at a high level compared to non-export companies. The highest level of labor productivity in the three groups of companies is related to the network gateway method of e-commerce business. Also, the specialized workforce in export-oriented companies is focused on the network gateway method. This is even though in non-exporting companies, the electronic business method has attracted the most specialized workforce.

MATERIALS AND METHODS

This study is a field study in terms of method. In general, it can be said that any scientific study, large or small, that systematically follows relationships, tests hypotheses. If it is non-experimental and it is studied in real-life conditions such as local communities, schools, factories, etc., it is considered a field study. From another point of view, this study is a correlational research. The statistical population of this research includes all the employees of Iran Khodro Company, whose number is 400. In this research, it is random sampling. In this research, we first use tables and graphs to describe the age, gender, education, and work experience of the statistical population. In this research, a questionnaire was used to collect data.

To measure reliability, Cronbach's alpha method was used using SPSS 21 software. Using the data obtained from these questionnaires and with the help of SPSS 21 statistical software, the reliability of this questionnaire was calculated using Cronbach's alpha method as 0.881, which is more than 0.7, so the reliability assumption of the questionnaire is confirmed. becomes

SPSS and AMOS software are used to analyze the obtained data. which is under exploratory research on the effect of e-business on timely delivery to customers in Iran Khodro Company. The purpose of inferential analysis is to generalize the results obtained from the researcher's observations in his selected samples to the main population (Khaki, 2009). From inferential methods in the form of correlation coefficients, non-parametric, parametric tests, and so on. . . used the computer software used is Spss. AMOS software was used for modeling and final analysis.

Data analysis is one of the main and most important parts of research. Raw data are analyzed using statistical software and after processing are provided to users in the form of information. To analyze the collected data of this research, using Amos 18 software, research hypotheses are investigated.

RESULTS AND DISCUSSION

Inferential Statistics

Calculating the Reliability of Research Questions

To determine consistency, coherence, or internal stability, the questions of the questionnaire that are supposed to measure the aspects of a concept or structure should have a relatively high correlation with each other. One of the measurement methods for internal consistency is the calculation of a type of reliability that is done through Cronbach's alpha and is known as the alpha coefficient. The general rule is that the Cronbach's alpha value of a questionnaire should be at least close to the numerical value of 70%. Of course, it should be noted that its high level (above 90%) is not always proof of good quality, because first of all, there may be multiple and single collinear questions, that is, the questions overlap (their common covariance is high), and in other words, the same thing they measure that in this case one of the questions that have a high overlap should be kept and the rest removed from the questionnaire. Secondly, the questions may have little correlation with each other, in which case it is better to pay attention to the other three items that appear in the SPSS report.

George and Mallery (2003) classify Cronbach's alpha values in the following five categories based on a rule of thumb. Therefore, according to Table 1, the value of Cronbach's alpha coefficient (0.788) indicates the acceptable reliability of the questionnaire.

Table 1. Classification of Cronbach's alpha coefficient

Excellent	(=	90%

Good	(=	80%
Acceptable	(=	70%
Doubtful and questionable	(=	60%
Weak	(=	50%
Unacceptable	(=	40%

Indexes such as mean, variance, and correlation of each item with the whole scale and Cronbach's alpha coefficient in case of removing each item in the set of 27 items are given in Table 2.

Table 2. Mean, variance, and correlation of each item with the whole scale and Cronbach's alpha coefficient in case of removing each item in the set of 27 items

Indicators	Average scale if item is removed	Variance of the scale if the item is removed	Correlation of each item with the whole scale	Squared multiple correlation	Cronbach's alpha coefficient if the item is removed
q1	93. 6150	166. 739	. 464	. 357	. 877
q2	93. 6100	168. 103	. 415	. 282	. 878
q3	93. 4575	167. 367	. 474	. 398	. 877
q4	93. 9875	166. 078	. 441	. 303	. 877
q5	93. 5050	165. 038	. 495	. 377	. 876
q6	93. 7625	162. 698	. 538	. 531	. 875
q7	93. 7800	164. 037	. 537	. 455	. 875
q8	93. 8675	166. 451	. 462	. 353	. 877
q9	93. 6175	167. 425	. 434	. 307	. 878
q10	93. 8675	165. 263	. 499	. 380	. 876
q11	93. 6750	166. 857	. 461	. 283	. 877
q12	93. 8925	165. 610	. 446	. 662	. 877

q13	93. 6075	162. 665	. 569	. 729	. 874
q14	93. 5075	168. 642	. 430	. 592	. 878
q15	93. 7550	168. 281	. 418	. 337	. 878
q16	93. 5550	165. 942	. 503	. 410	. 876
q17	93. 7950	166. 705	. 472	. 552	. 877
q18	93. 9225	167. 235	. 407	. 338	. 878
q19	94. 1600	171. 899	. 212	. 418	. 883
q20	93. 9025	166. 910	. 407	. 389	. 878
q21	93. 8225	162. 833	. 557	. 406	. 874
q22	94. 1100	167. 171	. 403	. 386	. 878
q23	93. 7850	170. 244	. 311	. 288	. 880
q24	93. 7725	170. 051	. 328	. 644	. 880
q25	93. 6250	169. 127	. 365	. 625	. 879
q26	93. 4900	170. 220	. 362	. 530	. 879
q27	93. 6525	170. 538	. 364	. 458	. 879

As can be seen in Table 2, the first column is the symbol of the items, the second column is the mean of the scale if that item is removed and the third column is the variance of the scale if that item is removed, the fourth column is the correlation of each item with all the items of the scale and fourth column shows Cronbach's alpha coefficient if that item is removed. If an item has a negative or weak correlation with other items and Cronbach's alpha increases if it is removed, it should be removed from the scale. Since none of the items have these conditions, they are not removed from the scale.

Confirmatory Factor Analysis

In this study, a questionnaire was used to collect data. Therefore, using confirmatory factor analysis, the general structure of the research questionnaires has been subject to content validity.

The measurement model represents the factor loadings of the observed variables (factors) for each latent variable. The strength of the relationship between the factor (hidden variable) and the observable variable is shown by factor loading. Factor load is a value between zero and one. If the factor load is less than 0.3, the relationship is considered weak. Factor load between 0.3 and 0.6 is average and if it is greater than 0.6, it is very favorable.

In confirmatory factor analysis, it is also important to pay attention to the fit of the model. Among the fit indices, if the ratio of chi-square to the degree of freedom is less than 2, the model has a good fit. The RMSEA index is less than 0.05. The closer the other indicators are to one, the more favorable it is (Qasemi, 2019).

In the following, the forms related to these analyses and the results of the factor analysis are presented. It is noted that the correlation between the errors in the shapes has increased the fit of the model. These connections are based on the modification index provided in AMOS software. In this way, the higher the modification index is for a relationship, the addition of that relationship in the model will improve its fit.

Confirmatory factor analysis of the supply chain variable

Model 1

Assessing the normality of supply chain variable data is presented in Figure 1.

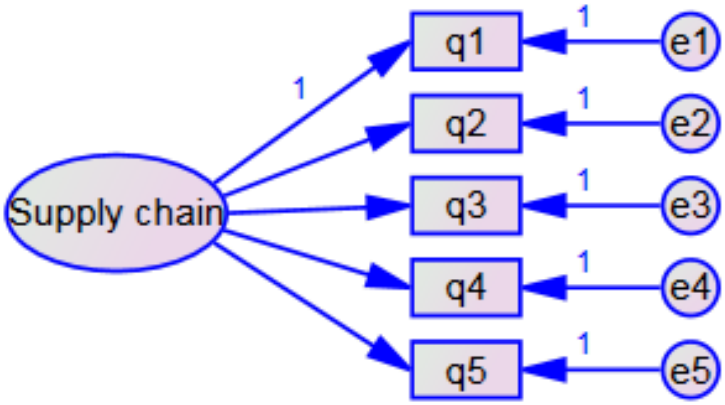

Figure 1. Assessing the normality of supply chain variable data

The absolute values of critical skew ratios are all greater than 2.58, but on the other hand, the absolute values of elongation ratios are mostly less than 2.58, and therefore, the variables have univariate normal distribution. "Merdia coefficient" in the last line and its critical value is more than 2.58. Therefore, the above 5 variables do not have a multivariate normal distribution.

Absolute fit indices are indices that are based on the difference between the observed variances and covariances on the one hand and the predicted variances and covariances based on the developed model parameters on the other hand. The existence of a high degree of freedom (close to the independence model) and a low chi-square (close to the saturated model) indicate the acceptability of the model and its desirability. The ratio of chi-square to the degree of freedom, which is called relative chi-square, is a suitable indicator for judging the developed model and data support, and a value lower than 2 is appropriate. In the above table, the value of 1.34 is reported and it shows the favorable situation for the model.

Confirmatory Factor Analysis of Customer Relationship Management Variable

Based on the results, the absolute values of critical elongation ratios are all less than 2.58. Also, "Merdia coefficient" in the last line and its critical value is less than 2.58. Therefore, the above 3 variables have univariate and multivariate normal distributions.

Specified and non-specified models

For the model to be specific, it is necessary to have two conditions called "rank condition" and "order condition". The variable model of customer relationship management has a rank condition because the degree of freedom of the model must be zero or positive, which is 0 in model 3 according to the following output:

6 is the number of non-redundant elements of the variance-covariance matrix of the observed variables.

6 is the number of free parameters defined in the model. The degree of freedom is the difference between these two values, and therefore, to modify the model, it is not possible to define another parameter in the model as a free parameter. This model is saturated.

Model 3 also has the order condition because it is possible to perform calculation operations in matrix algebra in order to estimate parameters and reproduce the variance-covariance matrix of the observed variables.In model 3, the chi-square value of the model was equal to zero and the model is saturated. These models cannot be tested because they can assume different states, according to Ray Koff and Markoulides (2002).

Confirmatory Factor Analysis of Information Technology Variable

According to the results, the absolute values of critical skew ratios are all greater than 2.58, but on the other hand, the absolute values of elongation ratios are all less than 2.58 and therefore the variables have univariate normal distribution. "Merdia coefficient" in the last line and its critical value is less than 2.58. Therefore, the above 4 variables have a multivariate normal distribution.

Specified and non-specified models

For the model to be specific, it is necessary to have two conditions called "rank condition" and "order condition". Model 4 has the rank condition because the degree of freedom of the model must be zero or positive, which is 2 in model 4 according to the following output:

10 is the number of non-redundant elements of the variance-covariance matrix of the observed variables.

8 is the number of free parameters defined in the model. The degree of freedom is the difference between these two values, and therefore, to modify the model, two other parameters can be defined as free parameters in the model.

Model 4 also has the order condition because it is possible to perform calculation operations in matrix algebra in order to estimate parameters and reproduce the variance-covariance matrix of the observed variables.The chi-square ratio of the information technology model to the degree of freedom is 1.24 and is suitable. The comparative fit indices are all above 90% and suitable. The RMSEA index is lower than 5% (0.025) and is appropriate. Economic indicators are all lower than 50% and are inappropriate. The Holter index is higher than 200 and indicates sufficient sample volume. Therefore, the whole model is a good fit.

Partial Fit Indices (Critical Ratio and Significance Level)

According to the output of the Amos software and the significance levels for the confirmatory factor analysis of the information technology variable, all the factors and their relationship with

the current variable were confirmed. Table 3 shows the standard coefficients, i.e. the extent to which each variable can play a role in measuring the information technology variable. According to the coefficients of item 13, i.e., information technology strategy with a coefficient of 0.71, and item 15, i.e., information sharing, with a coefficient of 0.48, have the least role in measuring the variable of information technology.

Table 3. Variances: (Group number 1 - Default model)

	Estimate	S. E.	C. R.	P	Label
IT	. 584	. 087	6. 743	***	
e1	. 557	. 064	8. 721	***	
e2	. 431	. 044	9. 913	***	
e3	. 675	. 053	12. 655	***	
e4	. 521	. 051	10. 142	***	

The results of the research hypothesis test

First hypothesis: supply chain is effective on productivity and timely delivery of products to customers.

Null hypothesis: The supply chain is not effective in productivity and timely delivery of products to customers.

Research hypothesis: The supply chain is effective in productivity and timely delivery of products to customers.

According to the results, the value of the test statistic is 21.41 and greater than 1.96, the upper and lower limits of the mean are positive and the same sign and the significance level is 0.000, which is less than 0.05. As a result, according to this evidence, it can be said that the null hypothesis is rejected and the research hypothesis is confirmed. The null hypothesis was defined as the lack of effect of the supply chain on productivity and timely delivery of products to customers, and the research hypothesis was defined as the effect of the supply chain on productivity and timely delivery of products to customers. The employees' view of the significant effect of the supply chain on productivity and timely delivery of products to customers is confirmed. According to Table 4, the average number of comments is 3.71, which is higher than the hypothetical average of 3. This means that the employees have considered the relationship between these two variables to be high.

Second hypothesis: Customer relationship management is effective in productivity and timely product delivery to customers.

Null hypothesis: Customer relationship management is not effective in productivity and timely product delivery to customers.

Research hypothesis: Customer relationship management is effective in productivity and timely product delivery to customers.

Table 4. Statistics related to the third hypothesis

Standard error of the mean	Standard deviation	Average	Sample size
0.04	0.75	3.54	230

Table 5. t-test for the third hypothesis

Test value=3					
Average confidence interval with 95% confidence		Mean difference	Level of significance	Degrees of freedom	The value of the test statistic
Low limit	Upper limit				
0.46	0.61	0.54	0.000	229	14.25

According to Table 5, the value of the test statistic is 14.25 and greater than 1.96, the upper and lower limits of the mean are of the same sign and positive, and the significance level is 0.000, which is less than 0.05, according to this evidence, it can be said that the null hypothesis is rejected and the research hypothesis is confirmed. The null hypothesis was defined as the lack of effect of customer relationship management on productivity and timely product delivery to customers, and the research hypothesis was defined as the effect of customer relationship management on productivity and timely product delivery to customers. In this test, the null hypothesis means no effect. It is rejected and from the perspective of employees, the significant effect of customer relationship management on productivity and timely delivery of products to customers is confirmed. Based on the results, the average of comments is 3.54, which is higher than the hypothetical average of 3. This means that the employees have considered the relationship between these two variables to be high.

Third hypothesis: Information technology is effective in productivity and timely delivery of products to customers.

Null hypothesis: Information technology is not effective in productivity and timely delivery of products to customers.

Research hypothesis: Information technology is effective in productivity and timely delivery of products to customers.

Table 6. t-test for the fourth hypothesis

Test value=3

Average confidence interval with 95% confidence		Mean difference	Level of significance	Degrees of freedom	The value of the test statistic
Low limit	Upper limit				
0.67	0.81	0.74	0.000	229	20.83

According to Table 6, the value of the test statistic is 20.83 and greater than 1.96, the upper and lower limits of the mean are of the same sign and positive, and the significance level is equal to 0.000, which is less than 0.05, as a result, according to this evidence, it can be said that the null hypothesis is rejected and the research hypothesis is confirmed. The null hypothesis was defined as the lack of effect of information technology on productivity and timely delivery of products to customers, and the research hypothesis was defined as the effect of information technology on productivity and timely delivery of products to customers. The significant effect of information technology on productivity and timely delivery of products to customers is confirmed. According to Table 6, the average number of comments is 3.74, which is higher than the hypothetical average of 3. This means that the employees have considered the relationship between these two variables to be high.

CONCLUSION

Based on the results, it can be said that the null hypothesis is rejected and the research hypothesis is confirmed. The null hypothesis was defined as the lack of effect of information technology on productivity and timely delivery of products to customers, and the research hypothesis was defined as the effect of information technology on productivity and timely delivery of products to customers. The significant effect of information technology on productivity and timely delivery of products to customers is confirmed. Finally, we can conclude that the average number of comments is 3.74, which is higher than the hypothetical average of 3. This means that the employees have considered the relationship between these two variables to be high.

ACKNOWLEDGMENTS: None

CONFLICT OF INTEREST: None

FINANCIAL SUPPORT: None

ETHICS STATEMENT: None

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