Investigating the Relationship between Electronic Commerce, Innovation and Technology with Customer Satisfaction

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Abstract: Attracting customers and clients is one of the most important goals of business organizations, firms and business unitsto increase profits and business success. Customer satisfaction is one of the most important factors in this field and increasing the clients by introducing and identifying a brand unit to othersleads to greater profitability and commercial success. For this purpose, customer satisfaction is very important in the present situation; therefore, different organizations are trying to increase it by various factors and services for achieving economic objectives.This study aimed to examine the relationship between electronic commerce, innovation and technology with customer satisfaction.The statistical population of this research consisted of all employees, managers and experts working in centers and enterprises active (or inactive) in electronic commercefieldAccordingly, 385 subjects (in each group) were selected according to Cochran formula by convenient sampling method and completed the questionnaires of customer satisfaction, innovation, technology and electronic commerce. The results of the research showed a significant positive correlation between electronic commerce, innovation, technologyand its dimensions including innovative management, advanced tools and equipment, on-line and supporting serviceswith customer satisfaction. Also, these components are strong predictors of customer satisfaction. According to the results, electronic commerce, innovation and technology are reasonable tools for increasing customer satisfaction.

Key words: Customer satisfaction, electronic commerce, innovation and technology, innovative management.

1. Introduction

The economy globalization, the rapid pace of technological change and the explosion of information made the companies to tolerate more pressure for survival in the competition. Also, environmental dynamism and ever-increasing competition forced the companies to become more competitive in business in order to increase customer satisfaction andattract new customers [1]. In other words, loyal customersare competitive assets in any organization and play an important role in the success of these organizations [2]. Therefore, the importance of the quality of services and products and their prioritization based on customer satisfaction by measuring their satisfaction can be effective in the survival of companies in this turbulent market [3]. In fact, selling a product and applying services and success in a competitive and economic market depends on attracting the customer and retaining the customer's trust than the desired

product [4].

Motivation for purchase is the first and most important principle in marketing and selling products and services [5]. According to marketing consultants, motivation is an internal movement that motivate customers and clients towards a particular product. Therefore, making motivation is an important element in the development and advancement of the economic and commercial objectives of manufacturing and service companies [6]. Undoubtedly, making this satisfaction and profitability havecrucialeffect on the organization's or company's employees, in other words, the dominant atmosphere of the company and organization, and the personality pattern of employeesis very effective in the quality of products and services [7].

In customer satisfaction, many factors involve the company as well as personnel and management style, the quality of the manufactured products and services. Although primary quality and tools are very important in the production and delivery of the product and services, but human factor as a basis for these products and services has a most important role [3].

According to the Rap, customer satisfaction is defined as an individual perspective that results from ongoing comparisons between the organization's actual performance and the expected performance of the client. In other words, customer satisfaction is a debate that directly predicts the benefits and business success in the field of sales and service delivery of the product, and has a direct and specific relationship with business success and the progress of production and organization growth [6]. One of the most important factors in customer satisfaction is to provide prosperity and favorable conditions for customer to use related services. One of the most important tools in this field is technology and knowledge in order to maintain the stability of the existing situation and provide innovative studies in the field of economic growthandthe quality and service is guaranteed with advancement of customer brand [8]. It seems that in all these stages and in advance of the business objectives, the role of management in various departments and the use of related resources with the application of innovative ideas and the most advanced technologiesis crucial in commercial success and commercial accreditation [1]. New technologies and tools provide the customer with superior content and quality of service [9]. and by providing the opportunity for online relationships and electronic commerce to save on the customer's everyday time and expenses, and this increasescustomer satisfaction from the quality of the products. Electronic commerce has opened up a new field due to its speed, efficiency, cost reduction and the exploitation of short-term opportunitiesand avoiding development will result to isolation in the realm of global economic [10].

It is clear thatelectronic commerce is a structural and functional area of the new form of business, whichprovides indirect and continuous communication between customers and organizations with providing the content and services [4]. This provides the basis for bilateral interactions and profitability in both time and facilities for both customers and organizations and benefits both groups. For this reason, the importance of electronic commerce in accelerating business relationships and the interactive role of innovation and technology on electronic commerce and customer satisfaction; this study examines the relationship between electronic commerce, innovation and technology with customer satisfaction.

2. Model of Study

Fig. 1 indicates the conceptual model and research plan. In this study, the relationship between electronic commerce, innovation and technology and its components including innovative management style, online and supporting services, and advanced tools and equipment is analyzed on customer satisfaction.

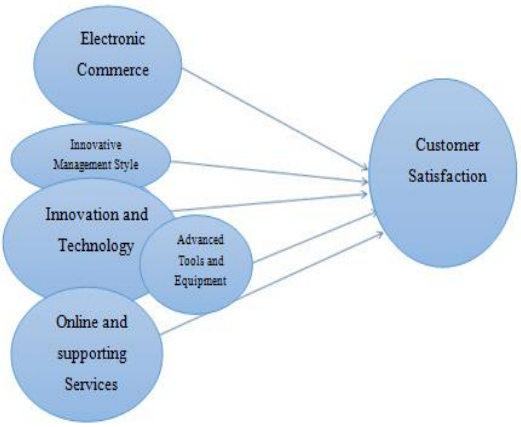

Fig. 1. Conceptual model of study.

3. Research Method and Information Gathering Method

This research describes current and existing conditions and relationships between them. Therefore, the nature of this study is descriptive-correlation of applied type.

In this study, two field and library methods were used to collect information and complete the questionnaire. The library method has been used to collect and complete theoretical foundations of the research. For inferential analysis and the relationships of research hypotheses and collect data, the field method and questionnaires have been used.

Tool:

In this test, SERQUAL customer satisfaction questionnaire was used to assess customer satisfaction. The questionnaire contains 15 questions with a Likert scale with a minimum score of 15 and a maximum score of 75. In this test, the questionnaire obtained Cronbach Alpha of 0.91 which indicates reasonable and reliable internal consistency of the test materials [10].

A researcher-made questionnaire was used to measure innovation and technology. This questionnaire has 15 questions. The method of this study was in a way that all variables were first measured by open and closed questionnaires at nominal, sequential, and intermediate levels. In this way, the questionnaires were first submitted to a small group of 20 people (from the pre-test population of the society and after the necessary reforms and to ensure the validity and reliability of the questions and items used by all sample individuals and responded to them and completed. This was done after the views of the professors and researchers using the Cronbach's Alpha and was confirmed following the removal of inappropriate items.

Content validity in general, indicates how much the questions represents the whole set of predetermined content. Content validity analysis is usually carried out by experts, scholrsbased on existing theories [9]. Cronbach's alpha coefficient was used to determine the reliability of the questionnaires. The results of the KMO test indicated that factor analysis was possible and, finally, three components includinginnovative management, online and supporting services and advanced equipment and tools showed that Cronbach's alpha for the entire questionnaire was 0.889 and for the subscales mentioned, respectively were 0.799, 0.796, and 0.712. The value above 0.7 indicates desirability of tool to measure innovation and technology.

In order to measure the use and use of electronic commerce, a researcher-made questionnaire containing 7 questions wereused and its content validity was verified by qualified experts; its reliability is equal to 0.801. Value of reliability more than 0.7 indicates a desirable tool for measuring electronic commerce.

Society and Sample:

The population in this research consisted of all employees, managers and experts working in centers and enterprises active (or inactive) in the electronic commercefield. convenient sampling will be carried out in

this research for the dispersion and inaccessibility to all sample members. The sample is usually a group of people who represent the community and include more or less characteristics of the community [5].

Due to the wide dispread research population on the one hand, and because of the limited number of studied communitieson the other hand, the following formula is used to determine the minimum sample size:

$$n = \frac{z^2 pq}{d^2}$$

where,

$$n = \frac{(1/96)^2 (0/5)(1-0/5)}{(0/5)(1-0/5)} \approx 385$$

n = minimum required sample size

p = distribution ratio of the trait in the community

$z\alpha/2$ = The value obtained from the standard normal distribution Table). In this study and given the error value of 0.05, the value obtained from the normal distribution table is 1.96.

d = The error accepted by the researcher or the tolerable interval from the estimated parameter is usually 0.05 in the social sciences [7].

4. Findings

Out of samples, 62% were 35-45 years old; 86% were married and 77% had academic and excellencedegree.

Table 1. Kolmogorov-Smirnov Test

Variables	Number of Sample	Significance
Innovation and Technology	385	0.164
Innovative management style	385	0.211
Advanced tools and equipment	385	0.189
Online and supporting services	385	0.114
Electronic commerce	385	0.258
Customer Satisfaction	385	0.348

At first, Kolmogorov-Smirnov test was performed to determine the possibility of carrying out a parametric test, namely, normalization which has a significant significance in all major components and subscales of 0.05, which reflects the rejection of opposite hypothesis and confirming the null hypothesis. Therefore, it is possible to perform a parametric test.

Then, to prove a significant relationship, Pearson correlation coefficient was used. Then, to show the value of this relationship, multiple regression equations including beta coefficients is used. Pearson's correlation coefficient, also known as torque correlation coefficient or zero-order correlation coefficient was introduced by Sir Carl Pearson. This coefficient is used to determine the relationship between the type and direction of the relationship between two distances or relative variables, or a distance variable and a relative variable. This coefficient is obtained from the following formula.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n(\sum x^2) - (\sum x)^2][n(\sum y^2) - (\sum y)^2]}}$$

Table 2. Correlation Coefficient between Research Variables

Customer Satisfaction	Electronic Commerce	Online and Supporting Services	Advanced Tools and Equipment	Innovative Management Style	Innovation and Technology	
					1	**Innovation and Technology**
				1	**0.71	**Innovative Management Style**
			1	**0.56	**0.80	**Advanced Tools and Equipment**
		1	**0.51	**0.55	**0.69	**Online and Supporting Services**
	1	**0.61	*0.43	**0.57	**0.68	**Electronic Commerce**
1	**0.57	*0.29	**0.49	**0.62	**0.64	**Customer Satisfaction**

**P<01 *P<05

The result of our correlation between the variables of research showed that there is a positive significant correlation between innovation, technology and electronic commerce with customer satisfaction at the level of 0.01. Also, among all the existing components, except for online and supporting services with customer satisfaction, which had a positive and significant correlation of 0.05, the rest showed positive and significant relationships at the level of 0.01.

In the following, the regression analysis is developed to determine the power of predicting the dependent variable by independent variables. In sum, the main goal of the application of multivariate regression was to create a linear combination of independent variables in such a way as to show the maximum correlation with the dependent variable. As a result of this linear combination, we can evaluate the organizational commitment and the importance of each of the independent variables in predicting the expected predictive variable. To perform linear regression, several defaults are required to be examined first:

Given that the distribution of variables is normal according to the Kolmogorov-Smirnov test, (the variance of the errors is constant and the mean errors are zero) and the dependent variable's scale is a distance, a linear regression test can be used. Another of the assumptions of the use of independence regression errors is the difference between the actual values and the values predicted by the regression equation of each other. If the assumption of non-correlation of errors is rejected, then it is not possible to use the regression equation.Durbin-Watson Test is used to check the independence of errors. The value of the test statistic is from one to four variables, and if the range of this statistic is from 1.5 to 2.5, the independencebetween errors is acceptable. The value of Durbin-Watson in this study is 1.79, which indicates no Correlation between errors and the possibility of linear regression in this research.

The results of regression analysis of variance were used to verify the validity of the linear relationship in the whole regression model, since the significance is less than 0.01, the null hypothesis is rejected and opposite hypothesis is confirmed; i.e. the linear regression model is valid in both variables.

Table 3. Analysis of Variance of Regression

Model	Significant value	F	Square average	Freedom degree	Total square
Innovation and Technology	0.000	18.15	705.14	3	2115.41
Electronic Commerce	0.000	22.12	1432.85	1	1432.85

Table 4. Regression Coefficient for Innovation, Technology and Electronic Commerce with Customer Satisfaction

Component	Beta Coefficient	Standard Error	Determination Coefficient	Regression Correlation Coefficient
Innovation and Technology	0.41	0.47	40.70	0.638
Electronic Commerce	0.38	0.59	32.94	**0.574**

In this Table, multiple correlation coefficient between the three predictor variables in innovation, technology and electronic commercefor the model and criterion variables is 0.64 and 0.57.The value of the explanatory factor is equal to 0.41 and 0.38; i.e. 60% of the variability of customer satisfaction criterion are explained by these three variables related to innovation and technology and 38% are determined by the components of electronic commerce. The rest of the variability in the variables are explained with other variables that the researcher has not concerned and included in the model. The results show that the two main electronic commerce, technology and innovation are powerful predictors of customer satisfaction.

Later, the companies and organizations that use electronic commerce and its principles with companies that do not have this industry and its comprehensive and active implementation are reviewed and analyzed in terms of customer satisfaction. The hypothesis in this regard is that there is a significant difference between customer satisfaction in organizations and centers active or inactive in thefield of electronic technology.

Table 5. Independent T Test for Difference between Customer Satisfaction in Companies and Organizations Active and Inactive in the Field of Electronic Commerce

P	t	Difference Average of Delta (Degree)	Average ±Standard Error (Degree	Group
0.001	4.68	9.3	4.65±48.5	Active Electronic Commerce
			3.81±39.2	Inactive in Electronic Commerce

The results obtained from Table 5 indicatep≤0.000. Therefore, the research hypothesis is confirmed. This means that there is a significant difference between the customer satisfaction averages in the group active or inactive in the field ofelectronic commerce. By comparing averages, the average customer satisfaction in the group active in the field ofelectronic commerce is higher than the group inactive in the field of electronic ecommerce.

5. Conclusion

It is noteworthy, for survival in the economy and selling the products and services, customers and clients

[11], and the most important component for attractingcustomers is increasing its customer satisfaction with the quality of the products and services provided by the organization and the company. In other words, satisfied customers of the services offered while staying as the regular customer also lead the company and the supranational organization [12]-[14]. In other words, the customer's convenience and comfort is a service that can benefit from it whenever and wherever pleases, and ultimately satisfaction is an incentive to reuse these services [11].

As clear, maintaining and increasing customer satisfaction is one of the most important requirements of economic development and its profitability. Therefore, various programs such as the use of innovation and technology in this direction and aimed at increasing customer satisfaction are used. In fact, the evolution of technology and tools in this field are the foundation of economic growth and the equipping of tools for production and the more favorable use of this process [15]. The application of technology not only focuses on the commercial and competitive market, which includes scientific advances and achievements such as medical sciences [8]. For this reason, such programs are the basis of success and achievement of goals.

Other new programs are based on the use of electronic commerce technology and related products, which also has a positive effect on business success and ease in the flow of exchanges and economic flows. For this reason, this research was designed to investigate the relationship between electronic commerce, innovation and technology with customer satisfaction. The results of this study showed that both factors of innovation, technology and electronic commerce have a positive and significant effect on customer satisfaction and arestrongpredictor for customer satisfaction and related requirements.

The results from this research and other researchare rooted in the coherent design and stable layout of this research on one hand and emphasizes the importance of accelerating the process of trade and sales and services appropriate in the form of various designs ofcustomer Satisfaction on the other hand. In other words, by simplifying and increasing the scope of access to contacts and purchasers, they can give incentives to buy and reuse the company and organization, thereby enhancing and maintaining customers, the process of economic growth and commercial success associated with it is also possible. For this reason, electronic commerce and innovation and technology play a crucial role in customer satisfaction.

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