

The Impact of Technology and Communication Infrastructure on Development of e-Commerce in Iran

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Abstract—The aim of this research is to identify the needed infrastructure for e-commerce and dealing with technology and communication infrastructure particularly. Also we are going to study whether technology and communication substructure is one of affective obstacles in creation and development of e-commerce, among other infrastructure of e-commerce. To collect the needed data for this research, the viewpoints of scholars were analyzed through some questionnaires and then the type of relationship between technology and communication factors and e-commerce was studied by using statistical analysis and regression techniques. The findings resulted from this research showed that there is a meaningful relationship between technology and communication factors and e-commerce. And it can be stated that technology and communication factor is one of the affective factors on creation and development of e-commerce. Finally, we tried to rank technology and communication factors effective on creation and development of e-commerce by using Freedman's test.

Index Terms—Development, e-commerce, information technologies, technology and communication infrastructure.

I. INTRODUCTION

Through the humane history some innovations have occurred that have caused great changes and have had extensive consequences. Innovations such as fire discovery, language invention, and money invention have created astonishing effects in human life. In the recent two centuries, the invention of steam engine resulted in industrial revolution era and this new invention increased human welfare. Also in the 20th century lots of innovations happened. One these vital innovations was utilizing computer networks and finally internet in business and trade affairs. This change and development in information technology and communications caused the emergence of information era in which knowledge about computer to use computer networks seems necessary and vital. E-commerce also is the result of information technology development which is eagerly welcomed in today's business world. Although e-commerce was created in the industrialized countries, it is accepted as a medium of exchange in developing countries, too. But as there are traditional infrastructure and business tools in these countries, they are not ready to carry out the novel economics (digital economics). Thus, companies are forced to identify and

supply the needed infrastructure in order to use e-commerce [1].

II. LITERATURE REVIEW

Billy and Lowrence [2] found out in their studies that innovations and inventions in the field of information technology has caused an increase in the demands for technologies useful in the industry and has created competitions in service industries especially in a worldwide measure. Thus, countries seek those new technologies in order to improve their optimization level which is directly related to the increases in economical growth [3].

Pohjola and Javala (2007) found out that the reason for the improvement in economic status in America in 1990s which was about 2.3 percent, was due to work force optimization because of utilizing information technology and communications. Also they supplied new evidences to estimate the amount of utilizing and creation of information technology and communications in comparison to economic growth in Finland. This research showed that the share of information technology and communications compared with production in Finnish markets, has increased from 0.3 percent in the early 1990s to 0.7 percent in late 1990s [4].

Zaree (2004) studied this issue in his paper entitled: "Studying the obstacles of developed use of e-commerce in Iran, with a special look at the big export companies of the country". He used random sampling method and his sample consisted 68 companies. The results of the research showed that increasing knowledge about the capabilities of e-commerce can increase the amount of e-commerce. Also knowledge of computer use and internet will have the most impact on the amount of e-commerce [5].

Torabi & *et al.* (2008) studied the importance and effects of globalization and the effects of novel economics emphasizing on the role of e-commerce on economic growth of the developing countries. The results of this research showed that in developing countries with an income level higher than the average, the variable coefficient of e-commerce is positive and meaningful, but the globalization variable coefficient is meaningless statistically. And in countries with an income level lower than the average, both e-commerce and globalization criterion variables have a positive relationship with economic growth [6].

III. RESEARCH HYPOTHESES

A. Main Hypothesis

Technical-communicational factors are obstacle of the creation and development of e-commerce in Iran.

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B. Minor Hypotheses

- 1- The lack of a suitable substructure is effective in creation and development of e-commerce in Iran.
- 2- The low amount of security in communication infrastructure and suitable connection protocols is effective in safe and standard creation and development of e-commerce in Iran.
- 3- The low level of bandwidth for connection and the quality of internet connection is effective in creation and development of e-commerce in Iran.
- 4- The lack of existing e-payment system and standard credit cards is effective in creation and development of e-commerce in Iran.
- 5- The lack of electronic signature issuing technology and identification system is effective in creation and development of e-commerce in Iran.
- 6- The lack of standard page codes of Persian language and Persian language problems in internet is effective in creation and development of e-commerce in Iran.
- 7- The lack of using barcodes and standardizing the barcodes is effective in creation and development of e-commerce in Iran.
- 8- The low level of electronic banking infrastructure is effective in creation and development of e-commerce in Iran.
- 9- The lack of the maintaining data center for internet networks is effective in creation and development of e-commerce in Iran.

IV. RESEARCH VARIABLES

In this research, the effective factors in creation and development of e-commerce in Iran are the independent variables which are as follows: low level of a suitable communications substructure (cell-phones, fixed telephone lines, optical fiber and so on), the low security in communications substructure and suitable connection protocols, security and standard, the low level of connection bandwidth and the quality of internet connection, the lack of electronic payment and standard credit cards, the lack of a technology for electronic signature issuing and identification, the lack of standard Persian language code pages and the problems of Persian language in internet, the lack of using barcodes and standardization of barcodes, the low level of electronic banking substructure, the lack of the main data centers for internet networks. In addition, e-commerce is a dependant variable which the researcher is trying to study the effective factors on creation and development of it.

V. RESEARCH METHODOLOGY

A. Research Method

Because this research, we have described the obstacles and effective factors on creation and development of e-commerce referring to the viewpoints posed by 50 scholars and specialists accessible for us, the present research for data gathering is descriptive-surveying and for purpose is a practical research.

B. Data Collection Method

Data collection in this research has been carried out through library study and reference to the specialists in the field and presenting questionnaires related to the needed data collection in this research.

C. Data Analysis Method

To analyze the data, The researchers first used t-student technique in multi-variable regression test to study the relationship among dependant and independent variables and then utilized Freedman's test for ranking each of the factors.

VI. STUDYING THE RESEARCH HYPOTHESES

A. The Main Hypothesis

- Technical-communications factors are obstacle of the creation and development of e-commerce in Iran. (Technical-communications factors are effective in creation and development of e-commerce in Iran).

• H0: $\mu \leq 3$

• H1: $\mu > 3$ $\mu = \sum f_i * x_i / N = 3.38$

The zero hypothesis states that H0 : $\mu \leq 3$, and our presupposition or claim is H1 : $\mu > 3$ (3 is average of 1,5 in Likert). The average amount resulted from our statistical society equals 3.38. This average is more than the suggested average (3). Thus, we can not accept the zero hypotheses. That is the main hypothesis of this research is accepted and we can say that technical-communications factors are effective on creation and development of e-commerce in Iran. In other words, technical-communications factors are effective obstacles on creation and development of e-commerce in Iran.

TABLE I: RESULTS OF MINOR HYPOTHESES' RESOLUTIONS

Hypothesis No.	Hypothesis result	Test statistics	Identification coefficient	Error level	Sig.
1	Hypothesis rejected	-1.112	-.147	0.05	.273
2	Hypothesis approved	-5.454	-.858	0.05	.000
3	Hypothesis rejected	-.869	-.111	0.05	.390
4	Hypothesis rejected	-.746	-.135	0.05	.460
5	Hypothesis approved	2.557	.366	0.05	.014
6	Hypothesis approved	4.505	.410	0.05	.000
7	Hypothesis approved	4.870	.582	0.05	.000
8	Hypothesis approved	2.393	.309	0.05	.022
9	Hypothesis rejected	.814	.089	0.05	.420

B. Minor Hypotheses

- H0: $\rho = 0$
- H1: $\rho \neq 0$ $\alpha = 5\%$
- $t_{\alpha / 2.48} = \pm 1.96$

It should be noted that when $Sig < \alpha$, H0 hypothesis is rejected and H1 hypothesis is approved (See table1). Also table 2 represents the results of Freedman's test, which shows ranking each one of the technical-communications factors is based on its importance.

TABLE II: RESULTS OF RANKING TECHNICAL-COMMUNICATIONS FACTORS

Technical-communications factors	Rank averages
1. The low security in communications substructure and suitable connection protocols, security and standard	7.96
2. The lack of electronic payment and standard credit cards	7.51
3. The lack of using barcodes and standardization of barcodes	6.61
4. Low level of a suitable communications substructure	5.60
5. The low level of electronic banking substructure	4.78
6. The lack of the main data centers	4.24
7. The lack of a technology for electronic signature issuing and identification	3.02
8. The low level of connection bandwidth and the quality of internet connection	2.98
9. The lack of standard Persian language code pages and the problems of Persian language in internet	2.30

VII. RESULTS

As it is observed in table 1, the minor hypotheses 4, 3, 1 and 9 are rejected. Thus it can be stated that the results of testing these hypotheses showed that obstacles such as: low level of a suitable communications substructure, the low level of connection bandwidth and the quality of internet connection, the lack of electronic payment and standard credit cards, and the lack of the main data centers are not considered to be among effective factors in creation and development of e-commerce by the specialists. In other words, they have much less effect compared with other factors on development and creation of e-commerce. Also the approving hypotheses 7, 6, 5, 2, and 8 shows the relatedness and great effectiveness of factors such as: the

lack of electronic payment and standard credit cards, the low level of electronic banking substructure, the lack of the main data centers, the lack of a technology for electronic signature issuing and identification and finally the low level of connection bandwidth and the quality of internet connection on e-commerce. Also table 2 shows the ranking of each technical-communications obstacles by using Freedman's test. This table shows the preference level of each sub-part of technical-communications factors according to the viewpoints posed by the specialists. Finally we can claim that although technical-communications factors are effective in creation and development of e-commerce (the results of the main hypothesis), the arrangement and importance of each sub-part of these factors may affect the type of decision-makings in utilizing or development of them. The results of minor hypotheses in this research showed that it is not necessary for all technical-communications factors to have positive or great effects in creation and development of e-commerce, and these effects can vary from one part to the other ones. Thus, to study the effects of technical-communications factors on e-commerce, it is necessary to study the effects of each sub-part separately and to make decisions about the types of their effects, investigate the overall effects carefully. On the whole, we can say that in this research technical-communications factors are among fundamental and effective factors on creation and development of e-commerce and they should always be considered by the scholars in the field.

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