

Barriers to E-Commerce in SMEs of Iran

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Abstract

Many barriers of e-commerce in SMEs are cited according to literature. By selecting e-banking and e-commerce experts and interviewing them, different aspects of barriers of acceptance and development of e-commerce in SME's were identified. A set of barriers were identified and a questionnaire designed and distributed among 89 e-payment company managers. Data was analyzed statistically.

Studying different aspects of barriers of acceptance and development of e-commerce in SME's, and leading to identification of the most important e-commerce barriers in Iran. According to the results, four factors of: "the absence of enough information and skills of personnel", "e-commerce incompatibility with structures and processes of company", "high investment costs for start of e-commerce" and "reluctance to organizational change and to keep status quo" are the most important barriers of implementing e-commerce in small and medium enterprises of Iran respectively. In other words, intra-organizational barriers are more important barriers in implementing e-commerce in SMEs of Iran. Moreover, four factors of "reluctance of the customers and suppliers to use e-commerce", "lack of enough law in e-commerce", "absence of enough information and skills of personnel" and "international sanctions of e-payments in foreign e-commerce" are the most important barriers after implementing e-commerce in SMEs in Iran respectively. That is extra -organizational barriers after implementation of e-commerce are more restrictive than the other barriers.

Keywords: E-commerce, Trade Barrier, Small and Medium Enterprises, SME, Iran

Introduction

Based on the model of Robin Lawson and Kaporaba, barriers of e-commerce are divided into two general groups of intra-organizational barriers (internal) and extra-organizational barriers (infrastructural and external). Internal barriers are the ones which are caused by structural and content nature of organizations, and managers and owners of company can remove them. Lack of skill of personnel, lack of return on investment, ambiguity of the provided services and products, customers and supporters' failure to use e-commerce, security concerns with e-payment are of internal barriers in e-commerce. Moreover, education and human resources management, production scheduling, communicational systems, financial management are included as important internal barriers (Amiri and Salarzahi, 2010). External or extra-organizational barriers are those that their removals are not in hands of managers and owners of company. Cultural, political, social, and legal barriers are of this kind. For example, lack of governmental policies to provide free e-commerce infrastructure facilities causes SMEs not to be enthusiastic enough to adopt e-commerce (Solaymani et al, 2012)

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Chitura and colleagues (2008) review the literature since 1990 and reached a list of e-commerce major barriers of small and medium enterprises. In his research, barriers are divided into two general classes of “no internet connection–very high expense of access to internet and fear of the society with new e-commerce technology etc.” and e-commerce barriers in 21st century such as “transportation problems, tax ambiguities, security problems and bank services limitations etc.”

In the present world and particularly in developed countries, many studies have been done for identification of major barriers of acceptance of e-commerce; some of which are referred in Chitura research. Love et al (2001) divide barriers of e-commerce in small and medium sizes construction enterprises in four organizational, financial, technical and behavioral dimensions as shown by the following table (1).

Table (1) Barriers of e-commerce in SMEs

Barrier Type	Barriers
Organizational barriers	<ul style="list-style-type: none"> – Inability to measure financial productivity of e-commerce – Absence of IT structures – Reluctance to organizational change and to keep the status quo – Absence of IT knowledge in organization
Financial barriers	<ul style="list-style-type: none"> – Financial risk – System maintenance cost – Personnel training cost – Ambiguity of e-commerce profitability
Technical barriers	<ul style="list-style-type: none"> – Absence of enough information and skills of personnel – Absence of required software – Security risks – Incompatibility of information systems
Behavioral barriers	<ul style="list-style-type: none"> – Fear with technology – Unreliability and ambiguity of e-commerce services (by personnel, customers and suppliers)

In this research as the first study that recognizes barriers of e-commerce in Iran. The statistical population is included in acceptance level 3 of e-commerce. All the companies in statistical population have passed acceptance stages, and they are in stage of use of e-commerce. That is all the selected companies have contracted with Saman Electronic Payment Company for receiving e-payment services so they have online payment in their e-commerce activities. This is the unique specification of the research and causes our statistical population to be the companies which are experienced in e-commerce category. This study leads to identification of the most important barriers of e-commerce in Iran. On this basis, we divide e-commerce barriers into two sections: barriers at time of accepting e-commerce, and barriers after accepting e-commerce. The small and medium enterprises in this research have good experiences in both dimensions.

Literature Review

As it can be considered in many developing countries, integration of e-commerce in current business procedures has modified the way business is accomplished (Rajabian,2008) and e-commerce plays a significant role in modern business performances. Doing electronic transactions, ordering online products , and utilization of electronic after-sale-services, etc. are of internet facilities in e-commerce. In addition, small and medium-sized enterprises (SMEs) cannot be ignored in the economy, and they are showing their entrepreneurial power to obtain chances provided by Information Technology (Hourali et al, 2008). There is a substantial and direct connection between electronic commerce and small and medium-sized enterprises to achieve economic circumstances. Studies have indicated that electronic commerce has the potential to enhance efficiency and productivity in many areas (Lawrence and A.Tar, 2010). In the Middle East countries there are complicated barriers to implement e-commerce procedures in SMEs, and it is understandable to consider these barriers due to modification in international business circumstances. SMEs are experiencing boosted competition as foreign firms gain connection to the local markets (Ghanatabadi, 2005). Therefore logical solutions to adoption of e-commerce in SMEs should be reconsidered. Several researches related to e-commerce barriers in small and medium-sized enterprises in some countries show different results from country to country:

1. Egypt (H. Zaied, 2012): Technical barrier on top of the list; legal and statutory barriers; due to shortages of internet security and safety; restricted utilization of internet banking and web portals by SMEs.
2. Libya (Hunaiti et al, 2009): High internet expenditures; inappropriate online shopping services and Libyan postal system; and Libyans' culture and restricted assurance in online trading systems.
3. Indonesia (Govindaraju and Chandra, 2012): Human Resources; origin of information; and push forces elements.
4. Ghana (Iddris, 2012): Shortage of right technical skills; e-commerce security and safety; primary expenditures; opposition by people and culture; low motivation by management; developed legal and statutory system shortage.

Analysis

Ten e-banking and e-commerce experts in Iran were selected and were interviewed. The experts included top managers of the banks that offer e-banking services and top managers of e-commerce and e-commerce professional authorities. The experts were asked to present their views on different aspects of barriers of acceptance and development of e-commerce in small and medium enterprises in Iran. The given views were collected and analyzed using Nvivo 8 software. Data (interview text with answers of the questionnaires) were coded and finally the software was used for investigating the available codes. After coding and extracting information from interviews, the extracted concepts were classified into two groups of intra-organizational barriers and extra-organizational barriers. Intra-organizational barriers were divided into 4 groups (including financial, organizational, behavioral and technical barriers) and extra-organizational barriers were divided into three groups (political, legal, socio-cultural barriers). At the end, the barriers identified by different interviews were adjusted to previous researches. The results are given in the following two tables:

Table (2-1) Obtained concepts from interview

Reference to previous researches	Statement's reference in interview	Barrier Class	Concept
1. Internal Barriers of Implementing E-commerce in Small and Medium Enterprises			
<ul style="list-style-type: none"> - Love, et al (2001) - Chia Hua, et al (2008) 	A, D, E, F, H, I	1-Financial	1- Financial risk
<ul style="list-style-type: none"> - Hadjimanolis (1999) - Lawrence (1997) - Puroo and Campbell (1998) - Love ,et al (2001) - Rita (2000) - Kapurubandara and Lawson (2006) 	A, B, C, E, H, I, J		2- Ambiguity in profitability and benefits of e-commerce
<ul style="list-style-type: none"> - Van Akkeren and Cavaye (1999) - Lawrence (1997) - Hadjimanolis (1999) - Poon and Swatman (1997) - Abell and Lim (1996) - Puroo and Campbell (1998) - Love, et al (2001) - MacGregor and Lejla Vrazalic (2005) 	D, E, J		3- High investment costs for start of e-commerce
<ul style="list-style-type: none"> - Love, et al (2001) 	H		4- Personnel training and learning costs
<ul style="list-style-type: none"> - Khan (2004) - Rita (2000) - Love, et al (2001) - MacGregor and Lejla Vrazalic (2005) 	A, C, D, E, H, J	2-Organizational	1- E-commerce incompatibility with structures and processes of the company
<ul style="list-style-type: none"> - OECD (1998) - Van Akkeren and Cavaye (1999) - Hadjimanolis (1999) - Lawrence (1997) - Abell and Lim (1996) - Crawford (1998) - Love, et al (2001) - MacGregor and Lejla Vrazalic (2005) - Kapurubandara and Lawson (2006) 	C, E, F, I, J		2- Absence of IT knowledge in the organization for implementing e-commerce
<ul style="list-style-type: none"> - Khan (2004) - Lawrence (1997) - Love, et al (2001) 	B, D, G, H, I, J	3- Behavioral barriers	1- Reluctance to organizational change and to keep status quo
<ul style="list-style-type: none"> - Love, et al (2001) - Gadwin (2001) - MacGregor and Lejla Vrazalic (2005) - Kapurubandara and Lawson (2006) 	A, B, C, D, E, F, G, H, I, J		2- Security concerns with e-payment
<ul style="list-style-type: none"> - OECD (1998) - Van Akkeren and Cavaye (1999) - Hadjimanolis (1999) 	C, E, F, I, J	4- Technical	1- Absence of knowledge and skill in personnel of the company

Reference to previous researches	Statement's reference in interview	Barrier Class	Concept
<ul style="list-style-type: none"> - Lawrence (1997) - Abell and Lim (1996) - Crawford (1998) - Love, et al (2001) - MacGregor and Lejla Vrazalic (2005) - Kapurubandara and Lawson (2006) 			
<ul style="list-style-type: none"> - Lowry, et al (1999) - Poon and Swatman (1997) - Puro and Campbell (1998) - Van Akkeren and Cavaye (1999) - OECD (1998) - Love, et al (2001) - MacGregor and Lejla Vrazalic (2005) - Kapurubandara and Lawson (2006) 	A, B, D, E, F, I, J		2- Security risks
<ul style="list-style-type: none"> - El-Nawawy and Ismail (1999) - Lawrence (1997) - MacGregor and Lejla Vrazalic (2005) 	D, E		3- Complexity of implementing e-commerce in the organization
<ul style="list-style-type: none"> - Crawford (1998) - Lawrence (1997) - Van Akkeren and Cavaye (1999) - Mac Gregor and Lejla Vrazalic (2005) 	H, J		4- Lack of enough time for implementing e-commerce
New finding	E		5- Clarifying affairs of the company (barrier for the companies which use all kinds of rants)

Table (2-2) Obtained concepts from interview

Reference to previous researches	Statement's reference in interview	Barrier Class	Concept
2- External Barriers of Implementing E-commerce in small and medium enterprises			
<ul style="list-style-type: none"> - El-Nawawy and Ismail (1999) - Ling (1999) 	A, B, C, E, H, I	1-Legal	1- Shortage of governmental supports
<ul style="list-style-type: none"> - OECD (1998) - El-Nawawy and Ismail (1999) - Crawford (1998) 	D, E, H, I	2-Socio-cultural	1- Lack of technological awareness in society

Table (2-3) Obtained concepts from interview

Reference to previous researches	Statement's reference in interview	Barrier Class	Concept
3- Internal Barriers of After Implementing E-commerce in small and medium enterprises			
– Love, et al (2001)	D, E, H, I	1-Financial	1- Lack of return on investment
– Love, et al (2001) – Chia Hua, et al (2008) – Ziad Hunaiti, et al (2009)	A, E, J		2- Use and maintenance costs
– Love, et al (2001)	H		3- Personnel training and learning costs
– Khan (2004) – Rita (2000) – Love, et al (2001) – MacGregor and Lejla Vrazalic (2005)	A, C, D, E, H, J	2-Organizational	1- incompatibility of e-commerce with structures and processes of the company
– OECD (1998) – Van Akkeren and Cavaye (1999) – Hadjimanolis (1999) – Lawrence (1997) – Abell and Lim (1996) – Crawford (1998) – Love, et al (2001) – MacGregor and Lejla Vrazalic (2005) – Kapurubandara and Lawson (2006)	C, E, F, I, J		2- Organizational barriers – shortage of IT skills in the organization for use of e-commerce
– Love, et al (2001) – Godwin (2001) – MacGregor and Lejla Vrazalic (2005) – Kapurubandara and Lawson (2006)	A, B, C, D, E, F, G, H, I, J	3-Behavioral	1- Security concerns with e-payment
– OECD (1998) – Van Akkeren and Cavaye (1999) – Hadjimanolis (1999) – Lawrence (1997) – Abell and Lim (1996) – Crawford (1998) – Love, et al (2001) – MacGregor and Lejla Vrazalic (2005) – Kapurubandara and Lawson (2006)	C, E, F, I, J	4-Technical	1- Absence of information and skills in the company's personnel
– Ziad Hunaiti, et al (2009)	E, F, G, I, J		2- Internet speed in the company
– Lowry, et al (1999) – Poon and Swatman (1997) – Puro and Campbell (1998) – Van Akkeren and Cavaye (1999) – OECD (1998)	A, B, D, E, F, I, J		3- Security risks

Reference to previous researches	Statement's reference in interview	Barrier Class	Concept
<ul style="list-style-type: none"> - Love, et al (2001) - MacGregor and Lejla Vrazalic (2005) - Kapurubandara and Lawson (2006) 			
<ul style="list-style-type: none"> - El-Nawawy and Ismail (1999) - Lawrence (1997) - MacGregor and Lejla Vrazalic (2005) 	D, I, J		4- Work complexity with e-commerce in organization

Table (2-4) Obtained concepts from interview

Reference to previous researches	Statement's reference in interview	Barrier Class	Concept
4. Internal Barriers of After Implementing E-commerce			
- Kapurubandara and Lawson (2006)	D, G, H	1-Legal	1- Continual changes in governmental changes
<ul style="list-style-type: none"> - El-Nawawy and Ismail (1999) - Abell and Lim (1996) - Kapurubandara and Lawson (2006) 	A, D, G, H, I		2- Lack of enough laws in e-commerce such as lack of digital signature
<ul style="list-style-type: none"> - El-Nawawy and Ismail (1999) - Ling (1999) 	A, B, H, I	2-Political	1- Lack of governmental support
New finding	A, E, G, H		2- International sanctions of e-payments in foreign e-commerce
<ul style="list-style-type: none"> - Kapurubandara and Lawson (2006) - Azizi Sharyar, et al (2006) - Lowry, et al (1999) - Hadjimanolis (1999) - Abell and Lim (1996) - Pracy and Cooper (2000) - Looi (2003) 	E, F, G, I, J	3-Socio-cultural	1- Reluctance of the customers and suppliers to use e-commerce
New finding	A, B	4-Technical	1- No connection of banks' networks to each other and dependence of all on Shetab banking system

Table (3) New identified barriers based on interviews (new findings)

References	Barriers	Obtained Concepts from Interview (Barriers)
A, E	Organizational	No clear affairs in online processes
A, D, G	Behavioral	Limitation of SMEs customers (no need of customers for e-commerce)
A, B, D, E	Technical	Lack of communication between banks (dependence on Shetab banking system)
A, C, D, E, F, G, I, J	Political	International sanctions in foreign e-payments
A, B, C, E, F, G, I	Socio-cultural	No concurrence of holidays inside the country with those outside the country

Considering the obtained results, total 20 barriers based on the previous studies and 5 new barriers based on realities in Iran were identified among 25 identified barriers.

In order to analyze the identified barriers in previous section (interview results), the barriers were divided into two classes (before implementation and after implementation of e-commerce) and on this basis, a questionnaire was prepared and distributed among the experts. A part of research is quantitative and another part is qualitative:

- A- In qualitative part: The experts of e-banking and e-commerce were selected and 10 experts were interviewed. These experts include top managers of banks that offer e-banking (top managers of the companies which perform e-commerce) and professional authorities in e-commerce.
- B- In quantitative part: 50 small and medium enterprises contracted with Saman Bank E-payment Company during 2006 to 2011 at least included in level 3 of e-commerce were selected.

Validity and Reliability of Interviews

In order to ensure authenticity and reliability of the collected data from the interviews, four criterions were used: Authenticity, Validity, Confirmability, and Transitivity. For this purpose, researcher communicated with the target places for a long time to attract the trust of the participants and understand the studied environment. The participants' review was used for authenticating data and codes. Interview text was returned to participant for coding to ensure authenticity of codes and interpretations. The codes which were thought by the participant not to indicate their attitude were corrected. Sampling strategy which included people in broad spectrum such as work experience, gender and position caused increase of data validity. The interviews text was reviewed by the supervisor, and the extracted codes and classes were considered by supervisor. To confirm transitivity, findings were given to two experts who didn't participate in the interviews and they confirmed fitness of the findings.

Validity and Reliability of Questionnaires

The questionnaire should have been confirmed in terms of validity before distribution. For this purpose, pretest method was used. In this stage, first, the questionnaire was distributed among 20 experts and validity of questionnaire was checked and confirmed. Then, the confirmed questionnaires were distributed among 53 nominated enterprises. Among these 53 enterprises, 82 managers and experts relating to the subject were selected and the final questionnaires were distributed among them. About 75

out of 82 distributed questionnaires were completed and collected. They were used for analysis of research information. Cronbach's Alpha Coefficient was used to testing the validity of questions. Results of Cronbach's Alpha Coefficient are given in table (4) for the questions related to each section. According to the above table, Cronbach's Alpha Coefficient was more than 0.7 for all questions that confirm the reliability of the research.

Table (4) Cronbach Alpha Coefficient for the questions relating to e-commerce implementation time

Cronbach's Alpha Coefficient	Question no.	Cronbach's Alpha Coefficient	Question no.
0.849	12	0.809	1
0.823	13	0.813	2
0.923	14	0.912	3
0.702	15	0.722	4
0.823	16	0.723	5
0.755	17	0.725	6
0.801	18	0.891	7
0.849	19	0.729	8
0.798	20	0.777	9
0.943	21	0.822	10
0.788	22	0.732	11

Interpretation of Results

Chi Square and Friedman tests were used for interpretation purpose. Friedman test is the nonparametric equivalence of ANOVA (Analysis of Variance) within groups. Friedman test was applied to tank the barriers of e-commerce implementation. Ranking of each of components according to Friedman test is entered in table (5).

Table (5) Prioritizing 22 barriers of e-commerce at time of implementation based on Friedman test

Row	Factors	Point based on Friedman test
1	Lack of enough skills of the company's employees	13.81
2	E-commerce incompatibility with structures and processes of the company	12.79
3	High investment costs for start of e-commerce	12.73
4	Reluctance to organizational change and to keep the status quo	12.65
5	High cost of outsourcing implementation of e-commerce	12.53
6	Concern with disclosure of commercial information in internet	12.44
7	Creating new security risks by implementing e-commerce	12.19
8	Complexity of implementing e-commerce in the enterprise	12.03
9	Lack of enough time for implementing e-commerce	11.95
10	Excessive clarification of commercial affairs of the company by implementing e-commerce	11.47
11	Lack of governmental financial support for implementing e-commerce	11.41
12	Application of governmental laws for implementing e-commerce	11.31
13	Concern with reluctance of customers to e-commerce	11.21
14	Suppliers and partners' failure to welcome e-commerce	11.17
15	Not ensuing return on investment in implementation	11.01
16	Inability to predict benefit and profit of implementation	10.95
17	Reluctance of owners and investors of the enterprise to give necessary credit for implementing e-commerce due to unknown gained benefits	10.81
18	Lack of enough experience and knowledge of the enterprise's personnel and managers	10.73
19	High expense of recruiting specialists in implementation of e-commerce	10.42
20	High training expense for the personnel of the enterprise for introduction to e-commerce procedures	10.15
21	Spending time and expense for replacing traditional structures and processes of the enterprise toward e-commerce	10.07
22	Resistance of suppliers against changes in implementation of e-commerce	9.16

As the above table shows, four factors: “absence of enough information and skills of personnel”, “e-commerce incompatibility with structures and processes of the company”, “high investment costs for start of e-commerce” and “reluctance to organizational change and to keep status quo” are the most important barriers of implementing e-commerce in small and medium enterprises in Iran respectively. Based on the obtained results, all the above 4 factors are regarded as organizational factors. In other words, intra-organizational barriers have higher priority in implementing e-commerce in small and medium enterprises of Iran. In table (6), significance of Friedman test was confirmed using Chi Square distribution. Significance of test confirms the model for 95% confidence level (for this level, significance degree of model is below 0.05).

Table (6) Results of Chi Square test

Inferential test	Components
75	Number of sample
53.027	Chi square
21	Degrees of freedom
0.000	Significance

Here, Friedman Test was applied to study the ranking of each of the barriers after implementing e-commerce using Friedman test. This prioritization was done based on Friedman test and the most important factors were ordered and presented.

Table (7) Prioritizing 24 barriers of e-commerce after implementation of e-commerce based on Friedman test

Row	Factors	Point based on Friedman test
1	Reluctance of customers and suppliers to use e-commerce	14.68
2	Lack of enough law for e-commerce	13.66
3	Absence of enough information and skills of the personnel	13.55
4	International sanctions of e-payments in foreign e-commerce	13.53
5	Suppliers and partners' failure to welcome e-commerce in relations with the enterprise	13.42
6	Low speed of internet in country	13.15
7	Instability of governmental laws in e-commerce	13.11
8	Lack of legal laws in digital signature section	12.95
9	Absence of IT knowledge and skills (hardware and software) in personnel of the enterprise	12.93
10	Complexity of applying e-commerce procedures in the enterprise	12.91
11	High expense of research and development and continual update of e-commerce systems	12.74
12	Personnel training and learning costs	12.70
13	High expense of e-payment processes compared with traditional payment methods	12.41
14	Incompatibility of commercial processes of the enterprise with e-commerce	12.35
15	Incompatibility of financial processes of the enterprise with e-commerce	12.28
16	Incompatibility of information systems of the enterprise with e-commerce	12.06
17	Absence of culture of using internet in society	12.02
18	Iranian banks' failure to provide e-payment services	11.79
19	Complexity of planning and management in the enterprise	11.59
20	High security risk of monetary exchanges in e-payment process	11.53
21	Failure to increase number of customers by implementing e-commerce	11.48
22	Failure to increase sale volume by implementing e-commerce	11.37
23	Failure to obtain profit and expected return by implementing e-commerce	10.97
24	High cost of maintenance and support of e-commerce systems in the enterprise	10.81

As table (7) shows, four factors: “reluctance of customers and suppliers to use e-commerce”, “lack of enough law for e-commerce”, “absence of enough information and skills of the personnel” and “international sanctions of e-payments in foreign e-commerce” are the most important barriers of after-implementing e-commerce in small and medium enterprises of Iran respectively. Based on the obtained results, three out of the above 4 factors are regarded as extra-organizational factors. In other words, extra-organizational barriers after implementation of e-commerce have higher priorities in small and medium enterprises of Iran. In table (8), significance of Friedman test is confirmed using Chi Square distribution. Based on the obtained results, significance of test confirms the model at 95% confidence level (at this confidence level, significance degree of the model is below 0.05).

Table (8) results obtained from chi square test confirms

Inferential test	Components
75	Number of sample
37.149	Chi square
23	Degrees of freedom
0.031	Significance

Conclusion

The results obtained from data analysis show that e-commerce barriers for small and medium enterprises in Iran are different at time of accepting e-commerce and after accepting e-commerce. The absence of knowledge and skills of enterprise's personnel is the only barrier at the time of acceptance and after acceptance of e-commerce. In study of barriers of implementing e-commerce, we can conclude that intra-organizational barriers have higher priority in implementation time of e-commerce and extra-organizational barriers have higher priority after implementing e-commerce. The most important barriers of e-commerce at time of acceptance are: absence of enough information and skills of personnel, e-commerce incompatibility with structures and processes of company, high investment costs for start of e-commerce and reluctance to organizational change and to keep status quo. The most important barriers of e-commerce after its acceptance are: cultural factor, reluctance of customers and suppliers to use e-commerce, lack of required laws in e-commerce, absence of enough information and skills of personnel and international sanctions of e-payments in foreign e-commerce.

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