

Barriers to E-Commerce Adoption in Egyptian SMEs

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Abstract — E-commerce has been predicted to be a new driver of economic growth for developing countries. The SME sector plays a significant role in its contribution to the national economy in terms of the wealth created and the number of people employed. Small and Medium Enterprises (SMEs) in Egypt represent the greatest share of the productive units of the Egyptian economy and the current national policy directions address ways and means of developing the capacities of SMEs. Many factors could be responsible for the low usage of e-commerce among the SMEs in Egypt. In order to determine the factors that promote the adoption of e-commerce, SMEs adopters and non-adopters of e-commerce were asked to indicate the factors inhibiting the adoption of e-commerce. The results show that technical barriers are the most important barriers followed by legal and regulatory barriers, whereas lack of Internet security is the highest barrier that inhibit the implementation of e-commerce in SMEs in Egypt followed by limited use of Internet banking and web portals by SMEs. Also, findings implied that more efforts are needed to help and encourage SMEs in Egypt to speed up e-commerce adoption, particularly the more advanced applications.

Index Terms — E-commerce adoption, e-commerce adoption barriers, Small and Medium Enterprises, e-commerce adoption in SMEs in Egypt

I. INTRODUCTION

The slow pace of e-commerce diffusion in SMEs sector has led to a variety of studies. These studies have reported that SMEs are generally lagging behind to large organizations as far as the adoption and usage of e-commerce is concerned^[1]. Fillis et al.^[2] examined the adoption of e-commerce by SMEs and found that SMEs could gain competitive advantage through adopting e-commerce as it could improve their market performance by having better access to the market. Bolongkikit et al.^[3] found among other issues that SMEs markets needed a high degree of human interaction. Taylor & Murphy^[4] argued that SMEs occupy small / clearly defined niche markets that do not need global connectivity through experimentation

as inhibitors to e-commerce adoption. Organizations adopting e-commerce in developing countries face problems such as lack of telecommunications infrastructure, lack of qualified staff to develop and support e-commerce sites, lack of skills among consumers needed in order to use the Internet, lack of timely and reliable systems for the delivery of physical goods, low bank account and credit card penetration, low income, and low computer and Internet penetration^[5].

The main objectives of this study are to investigate the barriers to e-commerce adoption in Egyptian SMEs and to suggest some recommendations for applying e-commerce successfully. The work begins by examining the nature of SMEs and e-commerce followed by discussing the barriers to e-commerce adoption based on previous research. The remainder of this paper is structured as follows: In the next section, a presentation of research methodology employed in the work was described. The results were later presented and discussion of the findings followed. The conclusions and recommendations finalized the paper.

II. SMALL AND MEDIUM ENTERPRISES (SMES)

Most of the international economies depend basically on the role of SMEs in supporting the national economy in different countries. SMEs contribute significantly to the economies of the African continent, representing around 90% of all businesses, and providing the main source of jobs and income for African people. In the non-oil-exporting states of the region, such as Egypt, SMEs account for a greater proportion of economic activity and international development organizations are active^[6]. In Egypt, SMEs historically played a relatively significant role in the process of economic development. The definition of SMEs is not unique; it varies across countries and in some countries, the definition differs further between sectors. Number of people employed and size of capital, sales, assets, etc. are used to classify enterprises into micro, small, and medium. The Egyptian Ministry of Industry (MOI) classified SMEs based on 'labor' and 'investment costs' criteria. Small and medium enterprises are defined as those having 10-49 and 50-

99 workers respectively. As to the ceilings for investment costs, they are set at LE 5 million and LE 10 million for the two groups of enterprises respectively ^[7].

III. E-COMMERCE

Electronic commerce refers to conducting business transactions over the Internet, which includes exchange of information of value in the form of products and services as well as payments, using web-based technologies ^[8]. Eurostat ^[9] defined e-commerce as transactions conducted over Internet Protocol-based (IP) networks or over other computer-mediated net-works (e.g. EDI if not carried out via IP). The Internet and e-commerce are transforming the way firms operate by redefining how back-end operations are conducted ^[10]. Studies of e-commerce issues in developed countries indicate that issues faced by SMEs in developing countries can be totally different ^[11]. Many SMEs in developing countries are not achieving even minimal levels of e-commerce adoption, also the adoption of web-enabled transaction processing by small business has not been as widespread as would be expected ^[12]. It has been demonstrated previously that the rate of e-commerce adoption in SMEs has been low.

IV. BARRIERS TO E-COMMERCE ADOPTION IN SMES IN DEVELOPING COUNTRIES

Although research indicates e-commerce offers viable and practical solutions for organizations to meet challenges of a predominantly changing environment, the available studies related to SMEs in developing countries reveal a delay or failure of SMEs in adopting e-commerce.

4.1 Early e-commerce adoption barriers in SMEs

Various sources of literature show that barriers to e-commerce adoption and diffusion in SMEs were initially reported in the period 1990 to 1999. In 1999, El-Nawawy and Ismail ^[13] in their study of e-commerce adoption by SMEs in **Egypt** reported that the main factors revolve around awareness and education, market size, e-commerce infrastructure, telecommunications infrastructure, legal system, government issues, affordability/cost structure and social and psychological factors. Also in a study of SME adoption of e-commerce in **South Africa** by Cloete et al. ^[14], authors reported several factors which affect the adoption of e-commerce in MSEs which include lack of information options, lack of time to investigate options, lack of access to computers, lack of

access to hardware and software, limited knowledge of e-commerce models and methodologies. In 2004, Chen ^[15] studied the reasons behind the slow adoption of electronic commerce by the Small and Medium Enterprises (SMEs) in **Taiwan**. The results showed that financial shortage and concern over lack of IT employees rank as the top two barriers to adoption of e-commerce by SMEs in Taiwan.

4.2 Recent e-commerce barriers in SMEs

In the period 2005 and beyond, several studies were also abounding with new barriers on e-commerce adoption in SMEs. Kaynak et al. ^[16] reported on the difficulty of finding and retaining qualified personnel with required skills and knowledge and the risk of dissipation of company specific knowledge. Whereas, Bolongkikit et al. ^[3] found among other issues that SMEs markets needed a high degree of human interaction. In 2007, Kshetri ^[17] analyzed e-commerce barriers in terms of three categories: economic barriers, sociopolitical barriers and cognitive barriers. Whereas, Rakhmanov ^[18] presented the main barriers affecting e-government development in **Uzbekistan** which negatively affected people's decisions to use the technology and inhibited decision makers from implementing or adopting e-government initiatives. Recently, Olatokun and Kebonye ^[19], assessed the adoption of e-commerce by SMEs in **Botswana** and found out the factors that led to e-commerce adoption, the kinds of e-commerce technologies that were adopted and used, as well as the services provided with these technologies. Also, Alshehri and Drew ^[20], studied the e-ready (readiness) of **Saudi citizens** to identify the challenges and barriers that affect the adoption of e-government services in Saudi society. They classified the barriers into five barriers: technical, organizational, social, management support and financial barriers. More recently, Alamro and Tarawneh ^[21] summarized the factors influencing e-commerce adoption in SMEs in **Jordan** into three contexts; these contexts were external environmental context (strong competition, global economy, regional trade agreements, extremely low labor cost in some countries, frequent and significant changes in markets and increased power of consumer), organizational context (changing nature of workforce, management support, financial resources, increased importance of ethical and legal issues, increased social responsibility of organizations and rapid political changes) and technological context (increase innovations and new technologies, e-commerce benefits, e-commerce barriers and rapid decline in technology cost vs. performance ratio). Some of e-commerce adoption barriers in SMEs are summarized in Table (1).

Table (1): Recent e-commerce adoption barriers in SMEs

Barriers to e-commerce	Sources
Absence of legal and regulatory systems	[22] & [23]
Change in regulations with each Government	[5] & [22]
Changes in government policy	[5] & [23]
Competitive pressure	[10] & [22]
Computer illiteracy	[24] & [25]
Cost too high	[20]; [23]; [26]; [27] & [28]
Culture differences	[20]
Difficulty in changing the existing working procedures	[20]; [28] & [29]
E-commerce infrastructure	[5]; [17] & [30]
Inadequate quality and speed of lines	[22]; [23]; [24] & [28]
Increase innovations and new technologies	[20] & [21]
Lack of an appropriate legal environment to apply e-commerce	[23]; [24]; [25] & [30]
Lack of e-trading legislations	[22]; [24] & [25]
Lack of awareness of e-commerce benefits	[12]; [24] & [31]
Lack of qualified staff	[5]; [17]; [28]; [32] & [33]
Lack of Internet security	[19]; [20]; [27]; [28]; 30; [32]; [33] & [34]
Lack of external pressure from suppliers and customers	[29] & [35]
Lack of management support	[20]; [36] & [37]
Lack of technical know how	[23]; [27] & [36]
Lack of financial resources	[12]; [17] & [20]
Lack of popularity for online marketing and sales	[10] & [22].
Lack of information on e-commerce	[20]; [22] & [32]
Lack of e-commerce standards	[23] & [32]
Lack of secure payment infrastructures	[23] & [28]
Low internet penetration	[17] & [23]
Low level of readiness among government institutions	[24] & [25]
Limited use of Internet banking and web portals by SMEs	[5] & [38]
Linguistic barriers	[20]; [23] & [25]
No simple procedures and guidelines	[22] & [39]
Trade agreements	[22] & [25]

V. RESEARCH METHODOLOGY

The main objective of this work is to investigate the barriers to e-commerce adoption in SMEs in Egypt. To fulfill the objective and achieve the goal, a framework for e-commerce adoption barriers in SMEs was used and a questionnaire was designed to collect the required information.

5.1 Framework for E-commerce Adoption Barriers in SMEs

E-commerce adoption is related to the level of ICT acquisition or adoption; therefore, investigation should be done with regarding to factors affecting ICT adoption in SMEs. The available researches reveal significant factors dealing with ICT and e-commerce adoption in SMEs, thirty barriers to e-commerce adoption were gathered from the literature. Several experts and professionals were interviewed to help in grouping the barriers. All interviewees agreed to group the thirty barriers into six groups as shown in the conceptual framework in figure (1).

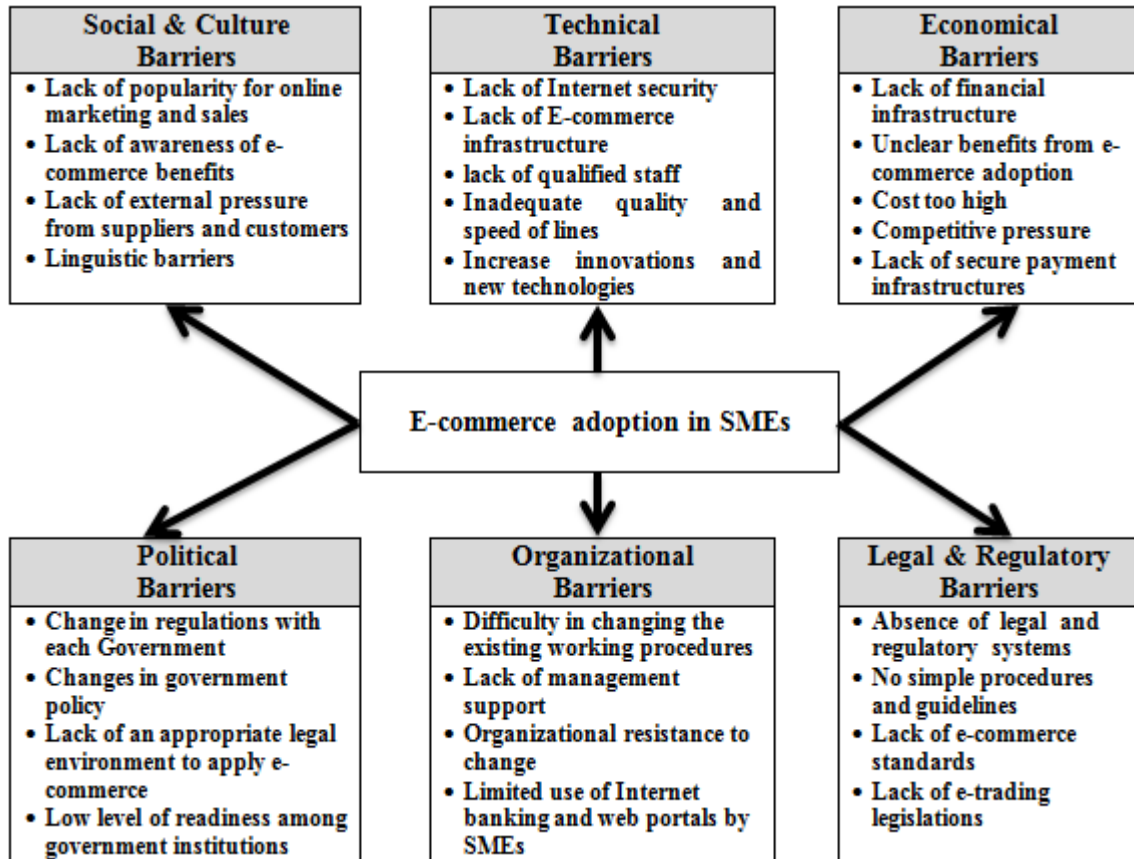


Figure 1. Conceptual framework for e-commerce adoption barriers in SMEs

5.2 Questionnaire Design

Structured questionnaire was used for data collection. The questionnaire was designed based on the conceptual framework for e-commerce adoption barriers in SMEs. The questionnaire consists of six groups with twenty six suggested barriers as shown in Appendix (I). in part “A”, the participants were asked to rate their perception towards the most important barrier that affects e-commerce adoption within their

enterprises on a five-point Likert-type scale with anchors from “5- Strongly agree” to “1- Strongly disagree”; whereas in part “B”, they were asked to mention the highest e-commerce applications. The rating used to assess the degree of importance for each group of barriers or single barrier is ranked according table (2). The group of barriers or single barrier receives strong or medium rating is accepted as an effective barrier on e-commerce adoption in SMEs.

Table (2): Rating used to assess group of barriers or single barriers

	Criteria	Rating
1	If the amount of population mean is greater than or equal 4.00, group of barriers or single barrier has strong effect	+++
2	If the amount of population mean is greater than or equal 3.00 and less than 4.00, group of barriers or single barrier has medium effect	++
3	If the amount of population mean is less than 3.00, group of barriers or single barrier has low effect	+

5.3 Research Sample and Questionnaire Distribution

The target population comprised small and medium enterprises (SMEs) in 10th of Ramadan city; 6th of October city; Sadat city and El-Obour city, Egypt. Stratified random sampling was used in selecting 150 enterprises working in the following fields:

- Wood and its Products
- Paper Products, Printing & Publishing

- Engineering - Electronic & Electrical Industries
- Lighting - Electricity & Power Production
- Service & Maintenance Centers

Two conditions were applied when selecting the sample: acceptance to participate and experience with e-service applications or at least has initiatives to apply e-commerce. After personal contact, ninety five enterprises were agreed to participate in the study conditioning to hide their names. Questionnaires were

distributed via mail; Email and personally (two copies for each enterprise). To assure the participants quick and correct response; the questionnaire copies were sent directly to the owners and/or managers. The total

numbers of received questionnaires were 147 copies out of 190 with total response rate 77.37 % as shown in table (3).

Table (3): Response rate

Sector	No. of enterprises	No. of questionnaires		response rate
		distributed	received	
Wood and its Products	12	24	17	70.83%
Paper Products, Printing & Publishing	13	26	19	73.08%
Electronic & Electrical Industries	27	54	49	90.74%
Electricity & Power Production	21	42	29	69.05%
Service & Maintenance Centers	22	44	33	75.00%
Total	95	190	147	77.37%

VI. RESULTS AND DISCUSSIONS

Some enterprises have websites (group of adopters 40 %) as shown in table (4), but most of them did not provide online sales processing; order tracking; online procurement and online payment. The top application being implemented by most of enterprises is electronic advertising (displaying enterprise information and products/services offered) as shown in table (5). The results show that there is no significant differences exist between enterprises that adapting and non-adapting ecommerce, so all respondents were combined to make a single sample. From the descriptive analysis's perspective, the average importance for the six groups of barriers ranged from 3.82 to 4.02 as indicated in table (6). Also, the results show that the twenty six barriers receive medium and strong rating (average importance between 3.1 and 4.63) as shown Appendix (II).

Table (4): Website usage

Sector	Adopting e-commerce (%)	
	Yes	No
Wood and its Products	25.00	75.00
Paper Products, Printing & Publishing	38.46	61.54
Electronic & Electrical Industries	33.33	66.67
Electricity & Power Production	33.33	66.67
Service & Maintenance Centers	63.64	36.36
Total	40.00	60.00

Table (5): Usage of e-commerce applications

E-commerce Applications	Percentage (%)	
	In use	Not in use
Electronic Marketing	60.53	39.47
Electronic Advertising	76.32	23.68
Customer Support Service	42.11	57.89
Order and Delivery	26.32	73.68
Payment System	0.00	100.00

Table (6): Average importance for the six groups of barriers

Groups of barriers	Mean	Rating
Social & Culture Barriers	3.79	++
Technical Barriers	4.02	+++
Economical Barriers	3.82	++
Political Barriers	3.98	++
Organizational Barriers	3.83	++
Legal & Regulatory Barriers	4.00	+++

According to the results, technical barriers are the most important barriers followed by legal and regulatory barriers then political barriers, and the least important barriers are social and culture barriers. All respondents agreed that lack of Internet security (4.63) is the highest barrier that inhibit the implementation of e-commerce in SMEs in Egypt, whereas the majority (over 80%) of respondents ranked the following barriers: limited use of Internet banking and web portals by SMEs (4.33); cost too high (4.22); changes in government policy and lack of e-commerce standards (4.20) as the most important barriers as shown in table (7). Barriers like difficulty in changing the existing working procedures (3.1); and lack of external pressure from suppliers and customers (3.29) received low importance compared with other barriers as shown in table (8).

Table (7): Average importance for the highest barriers in the six groups

Barriers	No. of participants					Mean	Rating
	1	2	3	4	5		
Lack of Internet security	0	0	0	55	92	4.63	+++
Limited use of Internet banking and web portals by SMEs	5	7	12	34	89	4.33	+++
Cost too high	6	5	16	44	76	4.22	+++
Organizational resistance to change	6	12	5	47	77	4.20	+++
Changes in government policy	5	9	11	55	67	4.16	+++
Lack of e-commerce standards	9	10	7	50	71	4.12	+++
Lack of awareness of e-commerce benefits	9	12	9	44	73	4.09	+++
Absence of legal and regulatory systems	8	11	9	51	68	4.09	+++
lack of qualified staff	7	10	14	51	65	4.07	+++
Change in regulations with each Government	11	13	6	47	70	4.03	+++

Table (8): Average importance for the lowest barriers in the six groups

Barriers	No. of participants					Mean	Rating
	1	2	3	4	5		
Difficulty in changing the existing working procedures	44	15	11	37	40	3.10	++
Lack of external pressure from suppliers and customers	17	23	32	51	24	3.29	++
Unclear benefits from e-commerce adoption	31	16	15	31	54	3.41	++
Lack of management support	22	15	8	42	60	3.70	++
Low level of readiness among government institutions	12	16	21	32	66	3.84	++
Linguistic barriers	10	11	23	45	58	3.88	++
Lack of e-trading legislations	19	10	9	40	69	3.88	++
Lack of an appropriate legal environment to apply e-commerce	10	13	19	47	58	3.88	++

These findings matched the results in similar studies conducted by Kartiwi & MacGregor^[32] in Indonesia; Kshetri^[17] in Nepal; Kapurubandara & Lawson^[22] in Sri Lanka; Fathian et al.^[30] in Iran; Alshehri & Drew^[20] in Saudi Arabia; Alamro & Tarawneh,^[21] in Jordan and Olatokun & Bankole^[28] in Nigeria. Referring to the study done by El-Nawawy and Ismail^[13], after more than ten years, most of e-commerce barriers mentioned in this study were solved except cost and legal issues still need some improvements.

VII. CONCLUSIONS

E-commerce has the potential to greatly improve how enterprise operates internally and how it serves its customers. E-commerce is much more than a tool for improving cost-quality ratios in SMEs services. This preliminary research investigated the factors that influence and inhibit the implementation of e-commerce in SMEs in Egypt. Based on the literature and the results of this research, the following conclusions are drawn.

- First of all, the results showed that most of SMEs in Egypt have only adopted basic applications. They widely adopted the most common e-commerce technologies (e-mail and Internet) as additional marketing tools to display company's products and services information, rather than as an e-commerce platform to enable online transactions. Indeed, the adoption of e-commerce applications like online payment system, order processing is at a relatively low level. The findings implied that more efforts are needed to help and

encourage SMEs in Egypt to speed up e-commerce adoption, particularly the more advanced applications.

- Secondly, factors that may hinder the implementation of e-commerce are: lack of Internet security and limited use of Internet banking and web portals by SMEs. So, security and privacy are critical issues that need to take the highest level of priority in e-commerce implementation process.
- Thirdly, with regard to the planning and implementation of e-commerce, creating a uniform strategic plan for e-commerce projects is the first step for successful adoption of e-commerce. Also, issues relating to Egyptian culture and societal structure should be addressed very carefully to influence and convince the Egyptian citizens to participate and become involved in e-commerce systems.
- Fourthly, citizen's awareness of e-commerce and other new e-services need be addressed to raise and promote the e-commerce benefits and advantages.

VIII. RESEARCH RECOMMENDATIONS

Based on the research result, the following suggested recommendations could help successful adoption of e-commerce in Egyptian SMEs:

1. Develop a political vision; strategic objectives; policies and design mechanisms for the cooperation between parties to control e-services, regardless type of service.

2. Adopt programs to protect the information to prevent misuse and to increase Internet security.
3. Attention and media publicity to increase public awareness to push customers and employees to make use of e-commerce.
4. Determine the strategic priorities of e-commerce adoption and redesign some of the actions in order to cope with the provision of e-commerce.
5. Study and simulation of the best experiences of e-government worldwide.
6. Continued focus on improving technical infrastructure necessary for the operation of e-commerce and the procedures and internal systems support e-commerce.
7. Finally, Government should improve the legal infrastructure such as privacy law, e-signature and knowledge acquisition law.

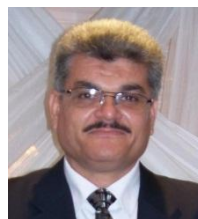
IX. LIMITATION OF THE STUDY

It should be noted that this study has several limitations. The data for the study were collected from various industry sectors, and it is not possible to make sector specific conclusions. Also, this is a quantitative study and further qualitative research is required to gain a better understanding of the key issues of e-commerce adoption in SMEs.

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Appendix (I): Questionnaire
Part A: E-commerce Adoption Barriers

Adopting e-commerce? Yes No

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree

Our enterprise does not use e-commerce because of:

Social & Culture Barriers		1	2	3	4	5
1	Lack of popularity for online marketing and sales					
	Lack of awareness of e-commerce benefits					
	Lack of external pressure from suppliers and customers					
	Linguistic barriers					
Technical Barriers		1	2	3	4	5
2	Lack of Internet security					
	E-commerce infrastructure					
	lack of qualified staff					
	Inadequate quality and speed of lines					
	Increase innovations and new technologies					
Economical Barriers		1	2	3	4	5
3	Lack of financial infrastructure					
	Unclear benefits from e-commerce adoption					
	Cost too high					
	Competitive pressure					
	Lack of secure payment infrastructures					
Political Barriers		1	2	3	4	5
4	Change in regulations with each Government					
	Changes in government policy					
	Lack of an appropriate legal environment to apply e-commerce					
	Low level of readiness among government institutions					
Organizational Barriers		1	2	3	4	5
5	Difficulty in changing the existing working procedures					
	Lack of management support					
	Organizational resistance to change					
	Limited use of Internet banking and web portals by SMEs					
Legal & Regulatory Barriers		1	2	3	4	5
6	Absence of legal and regulatory systems					
	No simple procedures and guidelines					
	Lack of e-commerce standards					
	Lack of e-trading legislations					

Part B: E-commerce Applications

E-commerce Applications	In use	Not in use
Electronic Marketing		
Electronic Advertising		
Customer Support Service		
Order and Delivery		
Payment System		

Appendix (II): Summary of Results

Barriers		No. of participants					Mean	Rating
		1	2	3	4	5		
Social & Culture Barriers		3.79						++
1	Lack of popularity for online marketing and sales	5	7	33	45	57	3.97	++
	Lack of awareness of e-commerce benefits	9	12	9	44	73	4.09	+++
	Lack of external pressure from suppliers and customers	17	23	32	51	24	3.29	++
	Linguistic barriers	10	11	23	45	58	3.88	++
Technical Barriers		4.02						++
2	Lack of Internet security	0	0	0	55	92	4.63	+++
	Lack of E-commerce infrastructure	12	16	21	32	66	3.84	++
	lack of qualified staff	7	10	14	51	65	4.07	+++
	Inadequate quality and speed of lines	9	10	22	49	57	3.92	++
	Increase innovations and new technologies	25	21	6	31	64	3.96	++

Economical Barriers		3.82						++
3	Lack of financial infrastructure	9	10	12	52	64	4.03	+++
	Unclear benefits from e-commerce adoption	31	16	15	31	54	3.41	++
	Cost too high	6	5	16	44	76	4.22	+++
	Competitive pressure	12	12	12	41	70	3.99	++
	Lack of secure payment infrastructures	14	16	19	49	49	3.70	++
Political Barriers		3.98						++
4	Change in regulations with each Government	11	13	6	47	70	4.03	+++
	Changes in government policy	5	9	11	55	67	4.16	+++
	Lack of an appropriate legal environment to apply e-commerce	10	13	19	47	58	3.88	++
	Low level of readiness among government institutions	12	16	21	32	66	3.84	++
Organizational Barriers		3.83						++
5	Difficulty in changing the existing working procedures	44	15	11	37	40	3.10	++
	Lack of management support	22	15	8	42	60	3.70	++
	Organizational resistance to change	6	12	5	47	77	4.20	+++
	Limited use of Internet banking and web portals by SMEs	5	7	12	34	89	4.33	+++
Legal & Regulatory Barriers		4.00						+++
6	Absence of legal and regulatory systems	8	11	9	51	68	4.09	+++
	No simple procedures and guidelines	14	12	10	46	65	3.93	++
	Lack of e-commerce standards	9	10	7	50	71	4.12	+++
	Lack of e-trading legislations	19	10	9	40	69	3.88	++