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An Empirical Investigation of Factors Affecting Electronic Commerce Adoption among SME's in Greece

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Abstract:

This study empirically investigates the drivers and barriers faced by small and medium sized enterprises (SME's) in Greece in the adoption of electronic commerce (EC). The study adopts the case study method of analysis documenting the adoption experiences of four SME owner managers from different companies operating in different industries. A research model is proposed suggesting innovation, technological, organizational and environmental issues which have been found in previous research to affect the adoption process. Implications from the analysis and recommendations for the improvement of EC development are presented as well as a path for future research. The study is important since it provides empirical evidence and a theoretically grounded understanding of EC level of adoption, it documents and analyses the important adoption drivers and barriers, and offers recommendations on the implementation of EC development to the SME manager owner.

1. Introduction

SME's constitute a very important component in the world economy. These entities "... are considered the backbone of national economies, by inspiring entrepreneurship, commercial growth, increased levels of innovation and competition (Dyerson et al, 2009). SME's operating in developed countries, such as the US and UK, have experienced high growth in EC over the past twenty years. However, challenges still exist to EC adoption and diffusion by SME's located in developing countries, which lack the necessary financial resources.

SME's in Greece account for 99,9% of all firms, 84,8% of total employment and 69% of value added (IMEGSEVEE, 2013). The national government agencies have recognized the importance of the exploitation of ICT towards economic growth, since SME's survival in today's over competitive business arena depends on adequate ICT utilization (Barba-Sanchez et al, 2007). Hence, a number of organizations have been created in order to promote ICT initiatives and policies. As a result, according to the annual EC survey published by the University of Athens EC Laboratory (ELTRUN), 35% of internet users purchased a product or service on-line during 2013, compared to 25% in 2012. This increase in online purchasing can yield, under certain circumstances, a total EC market in Greece totaling €6 billion (Doukidis, 2013).

Despite the effort and due to the recent economic crisis, most government and privately led initiatives have been postponed due to budget cuts.

By taking into consideration the aforementioned, the aim of this study is to focus on Greek SMEs in their pursuit to capitalize on EC opportunities. The study further makes recommendations to SME owners and policy makers on key areas of improvement in view of the prevailing challenges in EC adoption.

The research objectives are as follows:

- Exploring the level of EC adoption in Greece.
- Identifying and analyzing drivers and barriers to EC adoption.
- Discussing findings, and providing recommendations for the SME manager owner.

The answers to the above questions would contribute to the existing literature by addressing EC adoption and diffusion in the national context of Greece, and by introducing a research model which leads to a better understanding of the determinants of adoption of technology in a developing economy.

2. Literature Review

2.1. Theories

Since EC is a multi-discipline area, its practice has been examined through several perspectives including strategic management, information systems and entrepreneurship (Rosli & Noor, 2009).

2.1.1. Diffusion of Innovation Theory (DOI)

Rogers (2003) has identified five attributes which influence the rate of adoption by organizations. These perceived attributes are:

- “Relative Advantage, or the degree to which an innovation is better than what existed before,
- Compatibility, or the level of consistency of the new innovation with existing values, past experiences, and needs,
- Complexity, or the degree of difficulty of the new innovation,
- Trialability, or the degree of experimentation of the new innovation,
- Observability or the extent of the visibility of the results by the innovation.” (Rogers, 2003, p.222)

Ching & Ellis (2004) utilized the DOI model and found that significant factors explaining EC adoption include the “decision-maker age, education level, cosmopolitan outlook, relative advantage, compatibility, cost and customer pressure. No relationship was observed linking adoption with perceived complexity, incentives offered by suppliers, or rivalry” (p.421).

2.1.2. Technology-Organization-Environment framework (TOE)

Tornatzky & Fleischer, as cited in Oliveira et al (2014), proposed the TOE framework to explain the process of innovation within a firm. The model proposes three features which may influence the adoption of innovation, namely the contexts of technology, organization, and environment. The technology context refers to the internal and external technology within the firm and the technologies that are available for possible adoption. The organization context refers to characteristics of the firm such as organizational structure, size, managerial structure, resources and the process of communication (formal and informal) among employees. The environment context includes market elements, competitors, and the regulatory environment.

Scupola (2009) applied the TOE framework and suggests that important technological drivers include reduction in administrative load, advancement in communication, internationalization, and availability of EC related technology. Technological barriers include security issues, technology change and evolution, and lack of bandwidth. Regarding the organizational context, the most important adoption factors are top management support, employees’ knowledge and attitude towards EC, human and financial constraints, and employees’ suggestions towards adoption and implementation. Finally, important environmental factors include customer pressure, access and quality of “ICT consulting services” (p.13), customer readiness, and indirect government support (through EC specific programs).

2.1.3. The Perceived e-Readiness Model (PERM)

Molla & Licker (2005a) developed a holistic model to identify and explain contextual and organizational factors relating to EC adoption in developing countries. Their PERM model includes the Perceived Organizational E-readiness (POER) framework and the Perceived External E-readiness (PEER) framework. POER includes “the organization’s perception, comprehension, projection of EC and its potential benefits and risks” (p.879), managers’ commitment and “key organizational components, such as its resources, processes, and business infrastructure” (p.879). PEER “represents an organization’s assessment and evaluation of relevant external environmental factors” (p.879). Their findings (Molla & Licker, 2005b) suggest that “in developing countries, organizational factors, and especially human, business, and technological resources and awareness, are more influential than environmental factors in the initial adoption of e-commerce” (p.105). Post-adoption is affected “by environmental factors, together with the commitment and governance model of the organization” (p.105).

2.2. EC Adoption

Stockdale & Standing (2006) identified motivating and inhibiting factors responsible for EC adoption. Motivators included owner/managers’ enthusiasm, who had previous experience or training to EC, trading partner pressure, government initiatives and environmental factors. Inhibitors included lack of time, lack of knowledge relating to EC adoption benefits, lack of trust, technology constraints and support costs. Wilson et al, (2008) suggest that “five factors found to influence this adoption are top management support, management understanding of adoption benefits, presence of IT skills, availability of consultancy, and prioritization of EC” (p.489). Lip-Sam & Hock-Eam (2011) found that, among Malaysian SME’s, external support, in the form of governmental assistance, financing, training and tax incentives are significant factors in the adoption of EC. In addition, the same study found that SMEs with certain CEO characteristics are more likely to adopt EC. These characteristics include experience, higher education and frequent computer use. Sila (2013) found that a major driver for the adoption of EC is scalability, which “...refers to the economies of scale and scope provided by the Internet” (p.204). In a study of 275 North American firms, scalability was the biggest contributor of B2B EC usage, followed by pressure from competitors, network reliability, top management support, and trust. This factor enables the firm to expand and create new markets, and integrate with customers and suppliers (Sila, 2013).

2.3. EC Diffusion

An aspect of equal importance to EC adoption relates to how SME’s adopt EC. These studies focus on the extent of EC technology assimilation into operations, the type of technologies adopted, and the business functions that EC supports (Rosli & Noor, 2009). Daniel et al, (2002) found that firms in the UK went through four distinct clusters of adoption, namely, EC services development, e-mail use with trade partners, website operation and on-line ordering. Dyerson et al, (2009) identified types, motivations, barriers, and experience of ICT use. The types included e-mail, internet and company websites. Identified motivators were increase in operational efficiency, and keeping up with competitors. Barriers included cost and uncertainty over adoption benefits. Finally, actual benefits and problems included improved productivity, better product and service quality, faster response to customers, dependency on consultants, and system crashes.

2.4. EC Adoption Benefits

It has been widely suggested and accepted that the utilization of the Internet and EC can benefit SME's by increased competitive ability, cost effectiveness, new product launch, improved communications, and international market expansion (Cloete et al, 2002). Dubelaar et al, (2005) studied expected and consequent benefits from EB adoption in B2C environments. Their findings suggest that derived benefits were related to customer satisfaction, improved process effectiveness, increased income and enhanced value creation. Seyal et al, (2013), found that, among Bruneian SMEs, experienced B2B EC adoption benefits included "increased sale, manager's access to methods and models in making functioning area decision, increased flexibility in communicating with business partners, improved customer services, increased ability to compete, and providing managers better access to information" (p.258).

2.5. EC Adoption Barriers

Tan et al., (2007), suggest that fraud and risk of loss have been common themes as significant barriers to B2C e-commerce. Rose, et al., (1999) notes that EC can support one-to-one marketing; however, it significantly reduces the personal service element of traditional commerce. Other adoption barriers found in literature include lack of Internet and slow speed of communication (Molla & Licker, 2005), lack of skilled personnel (Cloete et al., 2002), business partner preferences (Parker & Castleman, 2009), cost issues associated with the adoption and diffusion, limited strategic "thinking" from the SME manager part, inadequate governmental support (Shemi & Procter, 2013) and the existence of the Digital Divide, a concept which refers to "SME's lagging behind large corporations as far as ICT and e-Business implementation are taken into consideration" (Arendt, 2008, p.83).

3. Methodology and Research Design

Based on the literature review an integrative model is suggested which will serve as a guide for the analysis of the research objectives. The model incorporates factors considered relevant to the adoption and diffusion of EC and are mainly based on the TOE, DOI, and PERM models discussed in the literature review section. The model is presented below.

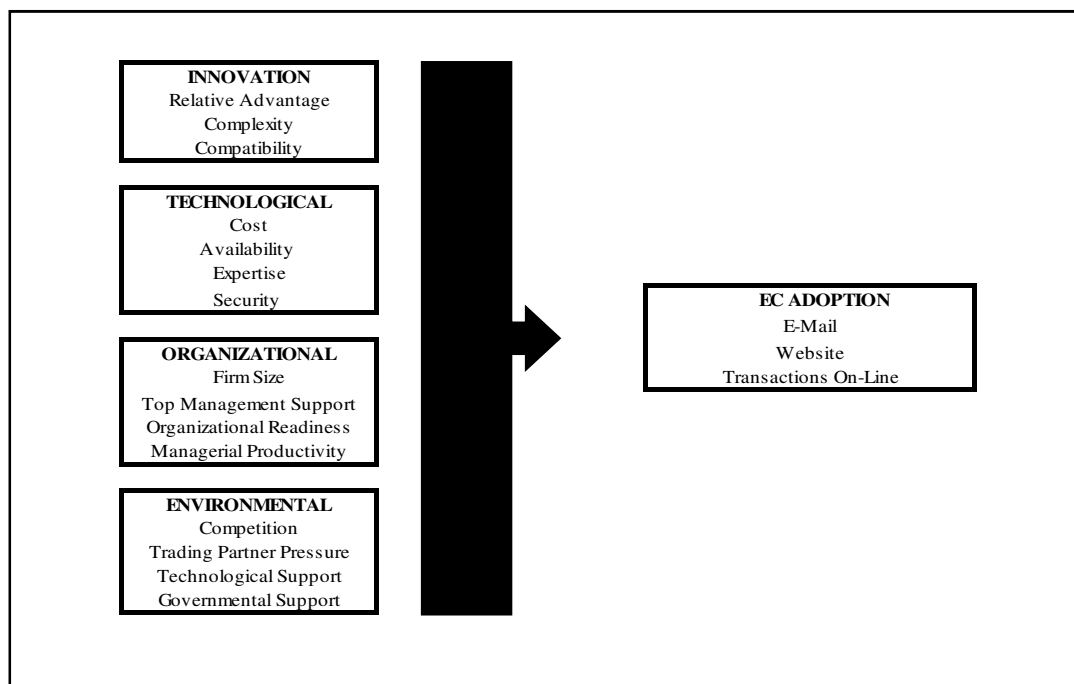


Figure 1: The Research Model

3.1. Within the Innovation Category

-Relative Advantage denotes the potential of EC adoption being perceived as better means of doing business than the existing practice within an entity. This perception can yield increased sales, reduced costs, and quick return on investment (Looi, 2005; Zhu et al, 2006b). Positive perceptions should be drivers of innovation adoptions (Alam et al, 2011). Complexity refers to the perception that innovations are less likely to be adopted if they are perceived to be complex. Innovation complexity negatively affects adoption (Ching & Ellis, 2004; Thong, 1999). Compatibility refers to "the degree to which an innovation is consistent with existing business processes, practices and value systems" (Zhu et al, 2006b, p.602). Compatibility also can refer to the degree that the innovation meets clients' needs (Alam et al, 2011).

3.2. Within the Technological Category

Cost refers to necessary expenses for EC adoption, including networks, PC's data storage servers, software and hardware (Wang & Tsai, 2002). The cost factor is particularly important to firms at the early stage of EC adoption (Alam et al, 2011). Availability and Expertise includes the organizations technology infrastructure and IT skills. These factors are essential and complementary to each

other for more effective EC adoption (Zhu et al, 2006b). Security is an important issue in EC adoption because it concerns exchanging personal and business data and on line transactions (Zhu et al, 2006b). Hence it has been viewed a key factor to EC adoption, from the firm and the consumer perspective (Alam et al, 2011).

3.3. Within the Organizational Category

Firm size refers to slack resources, structure and decision making flexibility. Although larger firms, possessing greater resources, may easier adopt technological innovations, they tend to be less flexible in using these technologies (Zhu et al, 2006b). Top management support refers to the commitment for innovation adoption by key members of the firm. This factor is significant for the adoption and diffusion of EC (Chong, 2000; Scupola, 2009; Sila, 2013; Teo et al, 2006). Organizational readiness includes the availability of financial resources, technological resources available to understand and implement EC and employees' awareness and commitment (Molla & Licker, 2005a; Pham et al, 2011). This factor was found significant in EC adoption studies (Tan et al, 2007; Thong, 1999). Managerial productivity refers to the notion that the practice of EC enables firms to improve their time management and communication skills (Grandon & Pearson, 2004b). The authors suggest that EC enables managers and employees to multitask and improve firm productivity.

3.4. Within the Environmental Category

Competition to pressure from competitors who have already adopted EC. Adoption can change the industry structure, and can create competitive advantage (Looi, 2005). Hence, a competitive environment "applies" pressure on a firm to adopt EC. Several studies suggest that competition can explain innovation adoption and usage (Al-Qirim, 2007; Ching & Ellis, 2004; Chong, 2000; Thong, 1999; Zhu et al, 2006b). Trading Partner Pressure refers to the notion that greatest value of EC can be achieved through its use by many members through the value chain (Iacovou et al, 1995). Technological Support is essential for EC adoption and includes access and quality of external ICT consultants (Scupola, 2009). Governmental Support increases the probability of EC adoption (Looi, 2005). Governments can encourage EC adoption and usage by a supportive legal framework, regulations, and incentives (Zhu & Kraemer, 2005).

The study was carried out using an exploratory qualitative research design. The multiple case study approach was implemented to define the boundaries between a phenomenon to be researched, and its context (Saunders et al, 2012) and to answer the "why", "what" and "how" questions which characterize explanatory and exploratory research. Initially, a list of a hundred and twenty 120 SME firms was utilized in order to classify the sample according to the author's knowledge of the SME manager. This classification was important because of the need for commitment of time and quality of information. Telephone calls were made to the manager owners in order to secure participation, to understand the level of EC adoption within the firm and to identify key interviewees within the SME responsible for the EC operations. Finally, four SME's were identified which met certain EC adoption criteria, representing various industries. The number of cases selected corresponds to Eisenhardt's (1989) recommended range of four to ten cases.

The adoption criteria were based on Daniel's (2002) four clusters of adoption which include firms which either develop EC services, use e-mail as communications tool, operate website services and are in the process of developing ordering facilities, use online ordering and are in the process of developing online payment systems.

Data Collection was performed through two main approaches namely, literature review and interviews. Literature review served the purpose of defining the context of the research, reviewing EC adoption in developing and developed countries, and analyzing the relevant theoretical frameworks. The aforementioned were performed through the Google Scholar search engine, and online databases including Emerald, JSTOR, Springer, Wiley Online Library and EBSCO host. Interviews took place in a face to face mode and through the telephone. A semi-structured form was used in order to enable the interviewee to extend the discussion beyond pre-determined issues. The interviews lasted about an hour and notes were taken without digital recording.

COMPANY	INDUSTRY	POSITION	LOCATION
A	Food Exports	Manager	Athens
B	Insurance Agents	Owner-Manager	
C	Recreation Clubs	Manager	
D	Steel Pipes-Tubes	Owner-Manager	

Table 1: Interviewed SME's

4. Findings and Analysis

4.1. Level of Adoption

4.1.1. A

A is a food e-shop with an advanced level of EC adoption and use of ICT technologies. The firm processes a dedicated, highly knowledgeable IT department which manages the implementation and institutionalization of the adoption process. EC adoption entails e-mail, a webpage, and advanced on-line transactions mechanisms. Finally, the firm executes B2B, B2C and B2G transactions.

4.1.2. B

B's EC adoption is characterized by the use of e-mail and a dedicated firm webpage. This limited company, specializing in insurance services, has a committed, highly knowledgeable IT department which manages the implementation and institutionalization of the adoption process. The firm executes B2B, B2C and B2G transactions.

4.1.3. C

C utilizes EC through its e-mail, website and payment applications. The firm does not have an IT department with specialized staff, rather, it outsources its needs to an outside consultant. The firm is in the process of improving its EC payment features to include memberships in order to service its current two-hundred-member base. The firm executes B2B and B2C transactions.

4.1.4. D

In the case of D, EC adoption is limited to e-mail utilization, which covers the communication function between the firm, its suppliers, customers and the government. The firm outsources both its ICT and EC needs. The firm is in the process of constructing a basic website to meet its legal form requirements, as mandated by the Greek government's ruling that all anonymous companies should post certain commercial information on their company website. The firm executes B2B and B2C transactions.

4.2. Adoption Factors

4.2.1. Innovation Factors

Relative advantage is found to drive EC adoption in 75% of the cases. This factor was seen not only as an important motivator for the initial EC adoption, the continuation and routinization of EC among the SME's. These firms have experienced increased company image, customer base, sales, access to competitors and product information, improvement in operational procedures, and cost reduction. These findings confirm previous ones regarding the significance of relative advantage as a driver of EC adoption (Alam et al, 2011; Jeon et al, 2006).

However, relative advantage was not viewed as an adoption driver in the case of one SME, namely, D. The commercial success of the entity was based on the "human" element present in transactions with clients and suppliers and not because of advanced technological adoption. This finding is similar to the one mentioned by Ching & Ellis (2004) who suggest that the degree of the relative advantage perceived is directly related to the level of EC adoption.

The complexity factor was viewed as an adoption barrier by all SME's. A's suppliers were reluctant to increase their transactions with the firm and employees initially perceived EC as a complex innovation. B's insurance agents refrained from utilizing B's EC platform to process paperwork, and employees in C and D continue to view EC adoption as an inflexible process requiring certain knowledge skills. These findings corroborate Sila (2013) findings related to North American SME's where, compared to larger firms, smaller ones find EC implementation to be a complex procedure.

As far as compatibility is concerned, three out of four SME's view EC adoption as well-suited for their organization. A's employees, management and partners agree that EC has become a way of life within the firm, feeling comfortable with placing orders, making payments, viewing products on-line. Suppliers, customers and younger agents find EC to be the most efficient way of transacting with B. Compatibility with procedures, firm values are also significant adoption drivers in C. These findings align with previous studies which suggest that increased perceived and experienced compatibility is associated with EC adoption within the SME firm (Alam et al, 2011; Grandon & Pearson, 2004a).

The compatibility factor was not an adoption driver for D. The entity has an organizational culture which does not support technology adoption and an environment which is less formal, based on a personal approach between employees and partners. This finding is similar to Thong's (1999) study of small businesses in Singapore who found that compatibility had no significant effect on the extent of IS adoption.

4.2.2. Technological Factors

The cost factor was an important adoption barrier for the majority of the SME's. During early adoption phase A managed by utilizing existing staff's IT knowledge and their network with technology suppliers. However, the firm's management recognizes that EC related software, hardware, and EC skilled staff constitute significant cost burdens to EC adopters. In a similar fashion, interviewees from B and D underlined the importance of cost, as a factor impeding EC initial and further adoption, particularly hiring additional expert staff. Contrary to the aforementioned, cost was not an adoption barrier for C because of the firm's ability to operate basic EC functions with the existing knowledge base and inexpensive outsourcing solutions. These contradictory findings have been observed in other studies in Europe and New Zealand (Zhu et al, 2006b; Al-Qirim 2007).

Availability and expertise is an adoption driver recognized by all SME's. Internal network reliability, IT knowledge, and technical expertise are all elements for successful EC adoption and diffusion, since outside IT consulting is costly and everyday management of the EC implementation is essential. These findings are similar to the study which examined Taiwanese firms, by Lin & Lin (2008), who found that IS infrastructure and expertise were significant determinants of EB use.

Security concerns refer primarily to data security issues related to on-line transactions (Sila, 2013). Security was a significant factor affecting SME's willingness to adopt EC in Brunei Darussalam and South Africa (Cloete et al, 2002; Looi, 2005). In line with these findings, only A's interviewee recognized security as a factor which threatens EC adoption. The other SME representatives mentioned

that security was either a negligible adoption factor or that the firm has adequately tackled the threat by purchasing the appropriate software and improving network infrastructure.

4.2.3. Organizational Factors

According to A's representative, firm size is an inhibitor to EC adoption since it is directly related to inflexibility in decision making, a factor which may negatively affect EC usage, particularly within the firm. All other SME representatives suggested that bigger firms have more financial, human and organizational resources which positively contribute to their EC adoption and diffusion. Therefore, the findings suggest a mixed picture as far as the role of firm size to EC adoption is concerned, similar to other previous studies (Zhu et al, 2006b; Thong 1999).

Management's attitude towards technological innovations is an important adoption factor since they are in charge of the execution of the firm's mission and objectives, but also because they are the link between owners and employees. Hence, top management's support may drive EC adoption within the firm (Wilson et al, 2008). In the case of A, prior exposure to EC, use of IT technology and positive perceptions regarding the advantages of EC within the industry, supported top management's attitude to adoption and diffusion. In B, commitment to innovation and organizational change drove top management's actions towards adoption. Finally, although D has a basic e-mail adoption function, its top sales manager perceives further EC adoption as a necessity. Only in the case of C, top management does not fully support EC adoption within the firm, due to the nature of their profession and lack of the educational background, experience and exposure to understand EC and ICT adoption benefits (Alam et al, 2011; Harindranath et al, 2008).

The managers from A and B both suggested that organizational readiness was an adoption driver. Within these firms, staff awareness in understanding the value of EC adoption and commitment to the adoption process, are key determinants to adopting and institutionalizing EC. However, both managers agreed that internal readiness is hampered by the lack of easy access to financial resources. The other two SME's managers noted that internal readiness was a barrier EC adoption. These views can be justified by taking into consideration the absence of awareness and commitment in both firms and the lack of financial resources for D. The findings support the importance of resources, responsiveness and dedication and their positive effect on EC adoption (Molla & Licker).

Managerial productivity had a positive effect on EC adoption in three out of the four entities. These firms' managers experienced better access to information regarding suppliers and customers, improved communications within the firm and between partners, and increase in managerial skills in the form of multitasking. These results are similar to the study by Grandon & Pearson (2004a) among US SME's.

4.2.4. Environmental Factors

The competitive environment as a driver for EC adoption was found in three SME's. Common themes among these entities were the observed trend of EC use among similar firms in Greece, the increased competitive intensity as a result of industry wide EC adoption, and the quest for EC based solutions. Similar findings are observed in Looi's (2005) study of SME's in Brunei Darussalam and Al-Qirim's (2007) study of EC adoption in small businesses in New Zealand. On the contrary, D's interviewee mentioned that, within its industry, EC adoption was not driven by pressure from competitors because similar small entities depend on their personal approach, not technology, to create competitive advantage. This finding is in line with Ching's & Ellis's (2004) study which suggests that competitive pressure did not predict EC adoption among SME's in Hong Kong.

Trading partner pressure was viewed as an important adoption factor by the majority of the SME's. This pressure from suppliers, customers and the government, who are the main partners, can be of direct and indirect nature. A's representative noted that if the EC adoption trend continuous at the current pace within the industry, most partners will demand, rather than ask, for the adoption. Similarly, C's customers and suppliers support, through their continuous membership renewal and business, the firm's EC adoption initiatives. The case of direct partner pressure for EC adoption can be seen in D's upcoming company webpage construction, where the government dictates that anonymous companies must publicize basic commercial information on-line for clarity reasons. These findings are in line with other studies which support the importance of trading partner pressure in implementing EB technologies (Iacovou et al, 1995; Grandon & Pearson, 2004b).

Within the environmental factor domain, lack of technological and regulatory support are recognized barriers to EC adoption by all interviewed SME's. Technological assistance and knowledge from outside vendors is a very expensive service monopolized by big firms charging fees which lie beyond SME's financial means. Usually, these services are provided within a combined framework with state assistance, but overpricing is a usual practice. In addition, the governmental role exists through state run programs aiming at consulting and subsidizing EC adoption. However, as the interviewees suggested, agencies responsible for these programs have a bureaucratic, unreliable, inflexible and selective approach to the whole process. As a result, the majority of SME's either utilize employees' advanced technological know-how or rely on their social and business network in order to meet their EC adoption needs, in a cost effective and prompt way. These findings are supported by previous studies (Al-Qirim, 2007; Scupola, 2009).

CATEGORY	A	B	C	D
INNOVATION				
<i>Relative Advantage</i>	D	D	D	-
<i>Complexity</i>	B	B	B	B
<i>Compatibility</i>	D	D	D	-
TECHNOLOGY				
<i>Cost</i>	B	B	-	B
<i>Availability-Expertise</i>	D	D	D	D
<i>Security</i>	B	-	-	-
ORGANIZATION				
<i>Firm Size</i>	B	D	D	D
<i>Top Management Support</i>	D	D	B	D
<i>Organizational Readiness</i>	D	D	B	B
<i>Managerial Productivity</i>	D	D	-	D
ENVIRONMENT				
<i>Competition</i>	D	D	D	-
<i>Trading Partner Pressure</i>	D	-	D	D
<i>Technological Support</i>	B	B	B	B
<i>Government Support</i>	B	B	B	B

Table 2: Factors affecting EC adoption (D=Driver B=Barrier)

5. Conclusion

The results of this study have implications for the small business owner-manager, for SME stakeholders and should be taken into consideration as far as EC adoption evaluation is concerned.

The study underlines the importance of compatibility with existing processes, systems and culture. Firms must be equipped and knowledgeable in order to be able to deal with the resistance associated with the adoption of technological innovations.

Effective EC adoption and diffusion can only occur with the support from the top management team which is committed to its implementation and has knowledge of the benefits and risks associated. Managers should act as agents of change within the SME in order to initiate and improve the adoption process.

EC adoption requires the organizational capability of the firm, in terms of resources, staff awareness and commitment. As EC diffuses and becomes a trend, financial, technological and human resources become an important aspect of success, particularly for SME's which are characterized as resource lacking entities. Also, staff awareness of the challenges and benefits of the innovation adoption along with their commitment to its implementation are important organizational aspects directly related to EC success.

Implications also exist by considering the competitive environment and trading partner pressure, including customer demand. As EC adoption becomes popular among firms' competitors, suppliers and customers in a globalized business arena, firms will increasingly be required to conduct business electronically. This is particularly evident in SME's in Greece which can benefit from EC advantages related to improved company image, access to international customers and efficient product delivery.

Finally, implications also exist at policy level. State agencies should capitalize on their ability to act as financial and educational partners by implementing transparent and carefully targeted state-led programs in terms of economic support and informational campaigns. The state must alleviate burdens experienced by SME's associated with the lack of financial resources, awareness and technical expertise.

Although this study includes a thorough literature review, expert interviews and a research model, several limitations exist. Firstly, the number of the interviewed firms is not large enough to capture information from different industries. Also, limitation exists to the extent that the study's findings can be generalized. Due to time and interviewee access constraints, the SME sample geographically belongs to the greater Athens area, the capital of Greece. This fact poses limitations because the view towards EC adoption from the owner-manager operating in this specific area may be different from the corresponding view of the SME owner-manager in a different part of the country. Finally, although the study's integrated model includes the most important adoption factors found in the literature, they constitute a subset of all the possible variables. Thus, other factors could have been included, such as the SME's product information intensity and international scope.

By taking into consideration the aforementioned limitations, the author presents areas for further research. Firstly, the study has shown the usefulness of the integrated research model for identifying driving and impeding factors that affect EC adoption. Hence, the model can be used to study other technological innovations. In addition, further research can expand the study's model and investigate EC diffusion. Since adoption occurs in stages, further investigation can focus on how the aforementioned factors affect each adoption stage. Also, there is need for further investigation into the role of each factor to EC adoption in different geographic and industry contexts, in Greece and in other developing and developed countries. Comparative studies can be of particular interest for practitioners as well as policy makers. Finally, additional research is recommended utilizing a wider sample and quantitative research methods in order to explore significance relationships between each factor.

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