

Information Technology Adoption in Small and Medium-sized Enterprises; An Appraisal of Two Decades Literature

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ABSTRACT

Small to medium-sized enterprises (SMEs) account for major source of employment, technological advancements, and competitive advantages for both developed and developing countries. Owing to the intensified competitive pressure and necessity for entering to global market undergone by SMEs, these businesses are incrementally employing Information Technology (IT) to take advantage of its substantial benefits. Most of prior researches have more focused on IT adoption in large organizations. However, and with regard to the limited resources controlled by SMEs, the process of IT adoption in this business sector is considerably different. The purpose of this paper is to analyze and contrast the internal and external issues affecting the process of IT adoption in SMEs to provide clearer understanding of this process by reviewing IT adoption literature, which includes more than 20 years of empirical research and case studies from a variety of databases with high concentration on certain SME-related issues. Proposed integrated framework demonstrates the process of IT adoption in SMEs through reviewing exiting perspectives in the literature. This study will assist different parties involved with adoption process including managers, vendors, consultants, and governments to achieve a practical synopsis of the IT adoption process in SMEs, which is believed to assist them with successful adoption.

Keywords: *Adoption process, Competitive advantage, Information technology, Information system, Small and medium-sized enterprises*

1. INTRODUCTION

The modern economic environment which is dominated by globalization, hyper-competition, and knowledge and information revolution has revolutionized the way business is conducted (Pavic et al., 2007). This new technological epoch is apparent through the intensified investment in computer-processing and data preparation appliance in the manufacturing and service industry and telecommunications infrastructure, and its widespread usage in government agencies, educational organizations, and, more recently, in the households. Owing to these technological progressions, the implementation and application of IT is a significant driving force behind many socioeconomic changes (Dierckx and Stroeken, 1999). As the utilization and commercialization of IT becomes more widespread throughout the world, the adoption of novel IT can generate new business opportunities and various benefits. Nowadays, both large organizations and SMEs are seeking out ways to reinforce their competitive position and improve their productivity (Premkumar, 2003). Accordingly, there is an increasing consciousness of the necessity to derive profit through investing in IT within SMEs. IT tools significantly assist SMEs through supplying required infrastructure necessary for providing appropriate types of information at the

right time. IT can also provide SMEs with competitiveness through integration between supply chain partners and inter-organizational functions, as well as by providing critical information (Bhagwat and Sharma, 2007). Prior IT literature however has shown that only a small number of studies focused on the adoption and use of IT in SMEs (Grandon and Pearson, 2004). Moreover, it has been found that in spite of exponential growth of IT within SMEs, the rate of IT adoption by these businesses has remained relatively low (MacGregor and Vrazalic, 2005) and large organizations have noticeably profited more than SMEs in both their IT-enabled improved sale and costs saving (Riquelme, 2002). In looking for reasons for such differences in IT adoption in SMEs, unique characteristics of these businesses can be highlighted. SMEs generally have limited access to the market information and suffer from globalization constraint (Madrid-Guijarro et al., 2009). Moreover, management techniques such as financial analysis, forecasting, and project management are rarely used by SMEs (Blili and Raymond, 1993). Tendency to employ generalists rather than specialists, reliance on short term planning, informal and dynamic strategies and decision making process, and lack of standardization of operating procedures are other distinctive characteristics of SMEs (Dibrell et al., 2008; Thong et al., 1996). However, restricted resources controlled by SMEs, which is commonly referred to as resource poverty (Thong et al., 1997; Welsh and White, 1981), is the major differentiator between SMEs and large organizations. Therefore, and with regard to the weakness of SMEs at different organizational and managerial, technological, individual, and environmental levels, the IT adoption and use in SMEs is in a disadvantage position in this respect (Al-Qirim, 2007; MacGregor and Vrazalic, 2006).

The aim of this research is to achieve a better understanding of IT adoption in SMEs through explicitly and understandably exploring and identifying factors influencing IT adoption process within SMEs in both developed and developing countries existing in the literature with high concentration on certain SME-related issues. Proposed conceptual framework demonstrates the determinants of IT adoption process in SMEs through review of prior literature including concepts, methodologies, theories, empirical research and case studies relative to IT adoption among SMEs, and by combining exiting perspectives. The research investigates and reveals a number of internal and external issues pressuring and persuading SMEs to adopt IT solutions. Likewise, barriers to IT adoption in SMEs will be addressed by reviewing and classifying IT adoption factors. Using the proposed conceptual framework, the authors categorize and elucidate the key factors that directly or indirectly, as well as positively or negatively impact the process of IT adoption in SMEs.

2. IT ADOPTION CONCEPT

In order to describe the process of IT adoption, it is essential to define IT, as well as to scrutinize the adoption concept. For this paper, an inclusive term of information technology is defined to cover the multiplicity of these technologies. Within the diffusion and adoption of information technology literature, there is no generally accepted IT definition as various definitions of IT have widely been employed by different researchers. IT might be regarded as technological aspect of Information System (IS) (Hollander et al., 1999), which is aimed for creation of computer-based IS by using computer systems in organizations (Sarosa and Zowghi, 2003). IT can be defined as *“those technologies engaged in the operation, collection, transport, retrieving, storage, access presentation, and transformation of information in all its forms ...”* (Boar, 1997). Moreover, IT adoption is defined by Tan et al. (2009) as application of Information and Communication Technologies (ICT) tools including computer hardware, software, and networks required for connecting to the internet. According to (Attaran, 2003) , *“Information technology is defined as capabilities offered to organizations by computers, software applications, and telecommunications to deliver data, information, and knowledge to individuals and processes”*, however, and with regard to the concept of supplier relationships, Carr and Smeltzer (2002) defined IT as the use of automated purchasing systems, supplier links through electronic data interchange (EDI), computer-to-computer links with key suppliers and finally information systems. In the light of aforementioned views, term IT will cover wide range of information processing and computer application in organizations in this study. IT will cover IS, ICT, internet and their infrastructure including computer hardware and software, those technologies that processes or transmit information to enhance the effectiveness of individuals and organizations. Furthermore, term IT also includes any computer application and required hardware packages, Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), EDI, and Enterprise Resource planning (ERP) which increase the productivity of businesses, as well as any technologies used for electronic commerce (EC) such as electronic funds transfer (EFT), intranet, extranet, collaborative planning, forecasting, and replenishment (CPFR) applications, supply chain communications systems, and electronic supply chain management systems.

On the other hand, different definition of IT adoption in organizations has been provided by prior literature such as decision to accept and use the innovation (Premkumar and Roberts, 1999; Tan et al., 2009; Thong, 1999; Zaltman et al., 1973), the full use of innovation as intended by the designer (Bøving and Bødker, 2004),

implementation success (Thong, 2001), extent of usage (Davis, 1989; Grandon and Pearson, 2004)) and effectiveness and success of adopted IT based on acceptance of or satisfaction with IT (Al-Gahtani et al., 2007; Al-Gahtani and King, 1999; Foong, 1999; Palvia, 1996; Palvia and Palvia, 1999). Thong and Yap (1995) defined IT adoption in SMEs as applying computer hardware and software solutions that provide support of operations, management, and decision-making in organizations. They explain that the aim of IT adoption (including computer applications such as CAD/CAM, EDI, MRP) is increasing business productively

2.1 IT adoption within SMEs

The rich diversity of different perspectives toward factors that affect IT adoption process is available on a huge body of literature. The review of previous research has identified a number of influencing factors. Most of these perspectives and studies have concentrated on influencing factors such as top management, organizational behavior and characteristics, firms' resources, government, customers, supplier and external IT consultant and vendors.

Based on a review of the existing literature on IT adoption in SMEs, an integrated framework has been developed and used to classify various issues and factors relative to process of IS/IT adoption within SMEs (Figure1). This model merely comprises different aspects of internal and external IT adoption factors (Drivers, Influencing factors and barriers) and does not categorize adoption factors based on being drivers or barriers of IT adoption in SMEs. The authors believe that the presented categorization of IT adoption issues and factors through developed conceptual framework can help governments, organizations, managers and IT consultants to achieve clearer understanding of IT adoption process. It also add further knowledge to the literature while more comprehensive study of IT adoption within SMEs investigating SME-related influencing factors simultaneous with other aspects (drivers, enablers and inhibitors) of IT adoption has been warranted by prior literature. In the first part, internal and external factors influencing IT adoption are discussed. This section puts forward a proposed conceptual framework according to the literature and also includes inclusive categorization, as well as review of factors influencing adoption process. Finally, a brief explanation on the IT adoption issues in SMEs would be followed.

3. INFLUENCING FACTORS

Within this study and as suggested by Figure 1, influencing factors are categorized into two major clusters of factors and their subcategories: internal and external factors. In addition, a brief review and categorizations of factors influencing IT adoption in SMEs has been offered in Table 1, those factors that are merely SME-related.

3.1 Internal factors:

Top management

In SMEs, IT adoption process is directly affected by top management where all decisions from daily functions to future investments are made by them (Bruque and Moyano, 2007; Nguyen, 2009). SMEs mainly have simple and highly centralized structures with the chief executive officers (CEOs) in which, in most cases, owner and chief manager are one and the same person (Ghobakhloo et al., 2011a). Some surveys have revealed that when the SME owner/manager as the key decision maker makes a decision or appoints a high significance and value upon internal or external duties, the organization will also be inclined to respond in an analogous fashion (Chau, 1995; Lybaert, 1998). A number of studies have revealed that in SMEs, the role of CEOs (top management or owner/manager) is central to enterprise since their decision influences all firms' activities, both in current and in future (Fuller-Love, 2006; Smith, 2007). This also refers to IT adoption decision from planning stage to the implementation, maintaining, and system upgrade stages (Bruque and Moyano, 2007; Fuller and Lewis, 2002; Nguyen, 2009). These decisions are mainly based on their experiential knowledge derived from combination of existing competencies of knowledge, personal experience, judgment, and their communication skills (Carson and Gilmore, 2000). However, Keh et al. (2002) discuss that CEOs knowledge and experience required for identifying opportunities is mostly attained by social relationship network rather than individualistic psychological traits.

According to the literature, several factors including management's perception of and attitude toward IT, support and commitment, IT knowledge and experiences, innovativeness, perceived behavioral control over IT, desire for growth, and familiarity with administration directly impact the process of IT adoption in SMEs (Drew, 2003; Lybaert, 1998; Premkumar, 2003; Qureshi and York, 2008; Thong et al., 1993; Thong and Yap, 1995).

Accordingly, the characteristics of the CEOs should be taken into consideration in the investigation of strategic activities, such as the adoption of innovations including IT as a new technology, and other novel technologies as well (Lefebvre and Lefebvre, 1992). Studies by Thong and Yap (1995) and Thong (1999) found that small businesses those have adopted IT are more likely to have CEOs possessing more positive attitude towards IT adoption. This view is reinforced by Caldeira and Ward's (2003) study confirming that positive attitude of top management has brought about the relative success of IS/IT adoption in SMEs, especially in manufacturing ones. In addition, it is argued that greater intention to adopt IT solutions is directly attributable to the more positive attitude of small minority business owner's toward IT adoption (Qureshi and York, 2008). Consequently, If the CEO perceives that benefits of IT adoption outweigh its risks, then the business is more likely to adopt IT (Thong and Yap, 1995). Prior literature suggests that when the management has been highly willing to implement IT application, SMEs do not perceive management priority on IT as a major barrier in adopting IS applications (Bhagwat and Sharma, 2007). In addition, positive attitude of top management toward using IT (as the users of IT in SMEs) will result in IT acceptance and subsequently success in SMEs (Al-Gahtani and King, 1999; Davis, 1993; Ghobakhloo et al., 2010).

On the other hand, IT adoption literature has provided evidence that top management support and commitment towards IS/IT adoption is one of the key cornerstone of higher levels of success and satisfaction with IS/IT adoption and use in SMEs (Fink, 1998; Ghobakhloo et al., 2010; Premkumar, 2003; Thong, 2001). Cragg and Zinatelli (1995) identified insufficient attention by management to IS as one of three main problem areas for computing in small firms. They argued that management can directly impact IS evolution and sophistication, since top management support and commitment is a key factor contributing to the IS success within small firms. For success of IT in Malaysian SMEs however it was found that anticipated benefits of computerization in SMEs can only be achieved by existence of five conditions including strong top management support as the key condition (Foong, 1999). In a similar context, and interpreting the successful adoption and use of IS/IT from the resource based theory, Caldeira and Ward (2003) and Ghobakhloo et al. (2011b) demonstrated that management support towards IS/IT adoption significantly participates in the IS/IT adoption success within SMEs. Opposite of what has been stated, Thong et al. (1993) and Thong et al. (1997) argued that there is no relation between the level of IS effectiveness and level of CEO support. Thong et al. (1997) defined top management support based on 5 elements (Table 2). They discussed that there is no difference in the level of IS effectiveness between small businesses with high levels of top management support and small businesses with low levels of top management support. The authors however believe that the role of top management support in IT adoption within SMEs in consequential and the Thong et al. (1993) and Thong et al. (1997) inconsistency in providing the support for this factor can be attributed to their definition of top management support and its measurement construct in their research.

CEO's IT knowledge and experience of IT is another trait affecting IT adoption in SMEs (Drew, 2003; Fink, 1998; Ghobakhloo et al., 2011a; Lybaert, 1998). A study by Thong et al. (1995) demonstrated that small businesses with CEOs who are more knowledgeable about IT are more probable to adopt IT. They discussed that greater knowledge of CEOs will reduce the degree of uncertainty entangled with IT which will result in lower risk of IT adoption (Thong, 1999). Moreover, Palvia and Palvia (1999) found that in SMEs, CEOs with higher levels of computing skills are more satisfied with the implemented IS rather than those having inferior skills while based on the literature, satisfaction with IS/IT is one of the most applied measures of IT success in organizations (Adamson and Shine, 2003; Jayasuriya, 1998; Palvia, 1996). These views are consistent with the findings of other studies which found that sufficient knowledge of IT and its consequent influences over organization could be provocative and supportive for IT adoption in SMEs (Fink, 1998; Lybaert, 1998; Sarosa and Zowghi, 2003).

Another influencing factor attributable to the top management characteristics is CEO innovativeness, both in general and IT-specific terms (Ghobakhloo et al., 2011a, 2011b). Personal Innovativeness in IT (PIIT) has been revealed to be a reliable predictor of users' attitude about the simplicity of use and effectiveness of new technologies (Nov and Ye, 2008). Agarwal and Prasad (1998) have defined PIIT as "the willingness of an individual to try out any new information technology". They discuss that PIIT is a major determinant of IT acceptance by moderating in perceived usefulness (PU), compatibility, and perceived ease of use (PEOU). Here, it should be considered that in most of IT acceptance model such as Technology Acceptance Model (TAM) (Davis, 1989), Decomposed Theory of Planned Behaviour (DTPB) firstly introduced by Taylor and Todd (1995) and the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003), as well as in majority of models of users' satisfaction including End User Satisfaction (EUS) model (Adamson and Shine, 2003), Model of Small Business User IT Satisfaction (Palvia and Palvia, 1999) and Wixom and Todd (2005) integrated model of user satisfaction and technology acceptance with IT, PU and PEOU are two key constructs of user behavioral intention and subsequently IT usage behavior. An empirical research by Thatcher and

Perrewe (2002) demonstrated that highly innovative individuals, having higher levels of PIIT, are more likely to look for stimulating experiences, as well as having more confidence in their competence to use IT. On the other hand, individuals possessing lower levels of PIIT are more probable to present general computer anxiety; also they might have less tolerance for risk. Findings of their empirical study illustrated the significant direct effects of PIIT on computer self-efficiency while computer anxiety partially mediated PIIT's effect on CSE.

In general terms however and in SME context, studies by Ghobakhloo et al. (2011a), Thong and Yap (1995), and Thong (1999) revealed that movement toward IT adoption in small enterprises with innovator CEO are more probable. Innovative CEOs would prefer to apply distinctive and risky solutions such as IT that change the structure in which the problems are generated. Thus CEOs' desire of being more innovative will expedite the process of IT adoption (Thong and Yap, 1995). Accordingly, the authors suggest that above mentioned studies and researches stress the significance of innovativeness in both general term and in term of PIIT on user perception and system acceptance where according to Scott and Walczak (2009), individuals with higher levels of PIIT will possess greater cognitive absorption and show higher computer self efficiency. In SMEs, where users of a new information system are both employees and owner/managers, innovative owner/managers will have a better attitude toward IT adoption.

Desire for growth is another characteristic of CEOs that deserves our attention as an important influencing factor over adoption of IT. Lybaert (1998) discusses that firm's size is positively related to the decision to accumulate additional information, and growth of a firm is coupled with the gathering of additional information. They found that SME's owner/manager, who makes most of the critical decisions and allows the firm to grow, uses more information when possesses greater desire for growth. Moreover, they argued that familiarity with administration is other important CEO-related determinant which influences the use of information and IS within SMEs. Lybaert (1998) study showed that comparing to CEOs not possessing knowledge of administration, CEOs with high familiarity with administration will use more information and subsequently IT.

Resources

SMEs have generally been distinguished by and are suffering from their restricted access to particular resources compared to big organizations (Igbaria et al., 1997; Nieto and Fernández, 2005). according to the literature of IT adoption and due to SMEs' unique characteristics, financial resources, technical and managerial resources, information resources accessibility, internal and external expertise, market accessibility, and in-house IT knowledge and experience are resources with ability to hinder or simplify the adoption of IT in SMEs, and to positively or negatively influence this process as well (Caldeira and Ward, 2003; Cragg and Zinatelli, 1995; Dutta and Evrard, 1999; Fink, 1998; Lybaert, 1998; Nguyen, 2009; Southern and Tilley, 2000; Thong, 2001). A study by Dutta and Evrard (1999) investigating the strategic management of IT and organization within small enterprises in six different European countries suggests that the differences between small firms which are capable to make the use of IT and those enterprise which are not is partially attributable to quality of the internal resources, predominantly manpower, and initially the control of technological information. They also stated that innovation is often impeded through an insufficiency of financial resources required for RandD.

Financial resources are one of the most considerable critical resources which are known as the key SMEs performance requirements and subsequently critical success factors based on resource-based theory (Rangone, 1999). In general, most SMEs are suffering from not having sufficient financial resources and most owner/managers invest their own personal assets (Fuller-Love, 2006). Limited financial resources compel SMEs to be cautious about their investment and capital spending (Ghobakhloo et al., 2011b). An imprecise IT investment decision can impose drastic financial consequences for SMEs and in extreme circumstances; it may lead to an insolvency and economical failure (Sarosa and Zowghi, 2003). As implementation of new IT system and its components requires long term investment (Nguyen, 2009) and concerning the high cost of IT infrastructure (Walczuch et al., 2000), only SMEs having adequate financial resources would regard adoption of IT as a feasible project to undertake (Thong and Yap, 1995), so that SMEs owner/managers who have access to necessary financial resources are more capable to establish desired IS (Lybaert, 1998). However, and despite a number of studies have revealed that the financial restriction of SMEs regarding IT adoption is attributable to the high cost of IT tools and infrastructure (Chau, 1995; Premkumar, 2003; Walczuch et al., 2000), Dibrell et al. (2008) and Wu et al. (2006) suggest that; as the price of computer hardware and software has been considerably declined in recent years, IT implementation expenses are not major factor hindering IT adoption process in SMEs regarding their limited financial resources. Nevertheless, it should be considered that along with the initial cost of computer hardware and software, other IS/IT implementation expenses including the cost of users training and development and the post deployment costs should be undertaken by SMEs during different phase of IT adoption (Nguyen, 2009). With regard to this view, Ein-Dor and Segev (1978) supposed that through

investing sufficient financial resources, the probability of IS implementation success within organizations will be increased. This view is empirically reinforced by Thong (2001) who demonstrated that after external expertise, IS investment is the second most significant determinant of IS implementation success in Singaporean small business. Their study demonstrated that higher levels of allocation for IS investment will amplify the possibility of IS implementation success in small businesses, while through this allocation for investment, small businesses will be able to hire more experienced external experts and/or implement better IS that meet their goals. Furthermore, due to abovementioned restrictions and regardless of decrease in the price of preliminary IT tools, SMEs are generally unable to meet the expense of other IT adoption costs such as taking expert professionals into service (Ghobakhloo et al., 2011b); therefore, SMEs are facing great difficulty hiring IT specialist to successfully implement IT with regard to financial constraints (Caldeira and Ward, 2003; Sarosa and Zowghi, 2003). This view is supported through a study by Pontikakis et al. (2006) of adoption of Internet-enabled Personal Computers (IEPCs) by Greek SMEs suggesting that when companies are traditionally facing with limited access to finance, a small number of SMEs are capable to rationalize costs of IT adoption, even as these costs encompass purchasing technology expenses (e.g. hardware and software) along with the costs of employee training, organizational restructuring and upgrading existing facilities.

On the other hand, and comparing to large organization, it has been acknowledged that SMEs are suffering from lack of in-house IT expertise which might negatively influence the process of IT adoption (Chau, 1995; Cragg and Zinatelli, 1995; Fink, 1998). As a result, SME are facing significant risks and problems with their computerization regarding their inadequate knowledge of IS/IT implementation (Igarria et al., 1997). Cragg and Zinatelli (1995) conducted a longitudinal study over an eight year period of IS sophistication and evolution in eighteen small firms and demonstrated that evolution and sophistication of IS within small firms will be drastically inhibited when small enterprises are suffering from lack of internal expertise. This view is supported through a study by Caldeira and Ward (2003) who revealed that internal expertise consisting of employees, supervisors, or those from top management are powerful determinants of IT adoption. In addition, Southern and Tilley (2000) categorized SMEs into three main groups based on level of ITC utilization; low users, medium users, and high users. They further found that the levels of IT (technological) expertise existing within the medium small firm users of ICTs are greater than low users of ICTs, while high small firm users of ICTs are more tendentious to have technological expertise than low and medium users.

In addition, knowledge of IT is another vital resource influencing IT adoption in SMEs. Development of internal IS/IT knowledge and skills is one of the most important basis required for providing superior levels of IS/IT adoption and satisfaction in SMEs (Caldeira and Ward, 2003). In general, lack of IT knowledge in SMEs can be regarded as a barrier to IT adoption since CEOs of SMEs might be bewildered by swift development of IT tools and countless variety of choices (Sarosa and Zowghi, 2003; Venkatesh and Brown, 2001). Therefore, with regard to this fact that SMEs generally lack IT resources and skills (e.g. IT knowledge and computing skills) (Chan and Chung, 2002; Igarria et al., 1997; Levy et al., 2001), these business can provide themselves with potential resources from networking and also benefit from it when it comes to adopting IT (Fletcher, 2002; Nguyen, 2009). In SMEs, networking can be defined as a number of interaction between organizations, counterparts, suppliers, customers, and vendors so that, they could be either personal network or business network (Palvia and Palvia, 1999). Hence, the networks are a crucial ways for acquiring access to external knowledge required for successful implementation of IT (Nguyen, 2009).

End users

In most of organizations, employees are regarded as significant assets which along with the role of owner/manager, the firm's survival and success seriously depend on them (Melville et al., 2004; Nguyen, 2009). These assets as the users of IT within SMEs are another precious resource of firms (Caldeira and Ward, 2003) which needs to be developed to contribute to the success of business (Egbu et al., 2005; Zhou et al., 2009).

Prior literature suggests that characteristics of IT users including knowledge of IT, training, attitudes and intention toward IT, and participation and involvement in adoption process could impact IS/IT acceptance or its adoption process as well (Caldeira and Ward, 2003; Fink, 1998; Fisher and Howell, 2004; Lybaert, 1998; Robey and Zeller, 1978; Thong, 2001). Limited use of IT and a lack of success in reaping benefit from computer hardware and software in organizations, those issues that have negatively affected IS/IT in SMEs is attributable to the lack of training and skills in organizations where the successful adoption of IT needs sharing of knowledge, training, and higher levels of skills by the employees who are users of IT (Egbu et al., 2005; Ghobakhloo et al., 2010). To facilitate the successful implementation of IS in SMEs, and to avoid adoption failure, these businesses should also augment the level of IS knowledge among potential IS users through providing firms' staffs with computer education and training courses (Thong, 2001). Sarosa and Zowghi (2003)

and Ghobakhloo et al. (2010) argue that IT acceptance within users of IT as a part of firms' employee will impose positive impacts on IT adoption. According to these authors, level of IT adoption and usage by users will be affected through provided IT course and training while higher knowledge of IT among users would help them in implementing the new technology.

Premkumar and Roberts (1999) suggest that increasing users' awareness of the benefits of information telecommunication technologies will also positively influence the process of these technologies adoption while this awareness could be amplified through improved education and training. Correspondingly, a study by Kleintop and Blau (1994) investigating impact of end users training on electronic mail system implementation demonstrate that end users practice with new IT system before its implementation will result in higher level of IT system acceptance. In addition, their research suggests that increase in amount of training among end users before IT implementation might lead to higher level of perceived ease of using IT, as well as perception of IS usefulness. Moreover, it is suggested that positive change or improvement of business functionality through new system may not be believed by some employees (Anderson and Huang, 2006). Regarding this pessimistic attitude, Bruque and Moyano (2007) suggested that employing new staffs instead of training current employees might be more effective way. This view is supported by more recent literature recommending that training should be provided to current staffs if cost of hiring new staff is higher than providing training to the existing employees and if there would be a substantial change in the IT through providing training (Ghobakhloo et al., 2011a; Nguyen, 2009).

A number of prior studies have demonstrated that employee acceptance and usage of and satisfaction with IT might be immoderately problematic regarding adoption success (Davis, 1993; Igbaria et al., 1997; Zhou et al., 2009) where according to Bull (2003), more than half the computer systems implemented in western countries are underused or not utilized at all. The acceptance of IT by users including managers, professionals, and operating level personnel, which is an essential condition for its success, can be regarded as the success measures including user attitudes, usage, and satisfaction (Al-Gahtani and King, 1999). Lack of user acceptance has long been confirmed to be an impediment to the success of new IS, so user acceptance is regarded as the key factor determining success or failure of IS/IT projects (Davis, 1993). In SMEs, Employees' attitude toward IT adoption might have significant impact on system acceptance and adoption success so that negative attitude of some users toward IT could negatively affect successful implementation of IT (Nguyen, 2009). They may not perceive that new IT can change or improve business function and when it comes to adopt IT, they might be worried about consequences such as threat of losing job (Irani et al., 2001). Nonetheless, employees' attitudes toward use of the IS will be encouraged through evident top management support which will bring about a more tolerable conversion from the existing work practices and company operations (Thong et al., 1997). Moreover, Davis, (1993), Igbaria et al. (1997), Straub et al. (1995), and Szajna (1996) found that attitude toward using, along with PU and PEOU can fully affect the acceptance of IT by its users. PU refers to "*the degree to which a person believes that using a particular system would enhance his or her job performance*" (Davis, 1989) while Davis (1989) defines PEOU as "*the degree to which a person believes that using a particular system would be free of effort*". Above mentioned view was validated in small businesses through a study by Igbaria et al. (1997) who demonstrated that users' IT acceptance in small businesses is directly affected by PU and PEOU. In addition, the contribution of PU in promoting personal computing acceptance in small businesses is mediated by PEOU.

On the other hand, employees' (as the users of IT) satisfaction with IT is another dimension of IT adoption success in SMEs (Adam Mahmood et al., 2000; Adamson and Shine, 2003; Al-Gahtani and King, 1999; Palvia, 1996; Palvia and Palvia, 1999; Yan et al., 2007). Contrary to technology acceptance literature focusing on individuals' behavior and beliefs, system and information characteristics have been regarded as core concepts in the user satisfaction literature (Ghobakhloo et al., 2010). Adam Mahmood et al., (2000) argue that end-user information satisfaction is strongly affected by perceived benefit and expectations characteristics, user background and involvement and organizational support and encouragement, as well as by subcomponents of these three factors. On the other hand, Palvia (1996) and Palvia and Palvia (1999) discuss that regarding unique characteristics of SMEs such as specific computing environment, mandatory environment, and resource constraints, as well as concerning this fact that employees and managers of SMEs as the users of IT are inclined to be specialist in various aspects of IS, rather than being very well qualified or expert in different IT roles, attributes of user satisfaction with IT in SMEs tends to be quite different from large organizations. Consequently, Palvia (1996) formulated the SBUSIT model to evaluate IT impact over SMEs based on IT user satisfaction measure. Afterwards, this model was developed by Palvia and Palvia (1999) through adding business related factors and owner/manager characteristics as two other determinants of users' satisfaction with IT in SMEs.

Despite SBUSIT and its developed version address the user satisfaction in small businesses in connection with their particular characteristics, this model has excluded user involvement as a determinant of user satisfaction in small business, while user involvement in IS/IT development has been largely considered as a significant mechanism leading to successful implementation of a new system (Amoako-Gyampah, 2007; Baroudi et al., 1986; Cynthia et al., 1997), specifically in SMEs (Fink, 1998; Foong, 1999; Thong, 2001, ghobakhloo et al., 2011b). In general, when a firm initiates to change to a new information and computer system, it may cause doubts over job security and makes employees worried about the adoption outcomes such as threat of losing job (Bull, 2003; Irani et al., 2001). As previously mentioned, positive progress or improvement of organization functionality through new IS may not be believed by some employees (Anderson and Huang, 2006), thus, it should be assured by owner/manager that employees are aware and have an understanding of the effects of changes to a new computer system on organization (Bull, 2003; Nguyen, 2009). Moreover, managers should keep employees aware that new IS/IT will enable them to make the best use of the resources that can help them be more productive (Premkumar and Roberts, 1999). In such circumstances, involving employees as a part of new projects and systems will make them believe that, as the members of a family, team or organization itself, they are very important to and responsible for new projects' success in organization. Hence, involving employees in the adoption process will result in higher levels of success (Amoako-Gyampah, 2007; Baroudi et al., 1986). Stewart et al. (2000) suggest that this user involvement should be initiated from the commencement of IT project feasibility studies, should continue throughout design phase, and must keep in deployment and testing stages.

On the subject of evaluating the role of user involvement in information system success, Thong (2001) demonstrated that user involvement in IS implementation is one of the most important factors for successful IS implementation and user information satisfaction. This view supports an empirical study by Foong (1999) on effect of end-user and systems attributes on computer-based IS success in Malaysian SMEs which demonstrated that satisfaction and systems usage can be improved through a higher level of user involvement in IT development. If end users could be encouraged to be involved with IS/IT implementation through having time-off from routine responsibilities, advantages such as better fit of IT to users' expectations, easiness of using the IT applications due to achieved IT knowledge and learning experience during the design phase, strong sensation of ownership, and decreased resistance to change could be achieved (Fink, 1998; Thong, 1999). These factors could increase the probability of successful IT implementation as well (Thong, 2001).

In sum, it could be inferred that CEOs of SMEs are not the only users of IT who contribute to the success of the implemented IT. Employees as the valuable assets of firms also have a drastic influence over adoption and successful implementation of new IT. Therefore, development of these resources seems to be necessary for the success of the business (Egbu et al., 2005; Ghobakhloo et al., 2011b).

IT solution (computer application)

Process of IT adoption within SMEs also depends on characteristics of implemented IS/IT itself which consist of a cluster of factors including type, process compatibility, user friendliness and popularity of implemented IS/IT, quality of software available in market, the costs of IT, and perceived impacts and benefits of IS/ITs on organization (Caldeira and Ward, 2003; Cynthia et al., 1997; Foong, 1999; Premkumar, 2003; Salmeron and Bueno, 2006; Walczuch et al., 2000). A study by Shin (2006) of adoption of enterprise application software reveals that easy-to-understand, and relatively long-experienced enterprise applications are more effective in SME as compared to hard-to-understand and brand-new applications. In addition, quality of IS/IT available in market and its type could be an important factor affecting IS/IT adoption and use among SMEs (Caldeira and Ward, 2003) where regarding IT as a major resource required for achieving satisfactory performance for business, its quality refers to attributes of selected IT, its reliability, and usefulness (Sardana, 2008).

Another factor that affects adoption of IT within SMEs is cost of IS/IT. Fink (1998) suggests that it is imperative that managers should consider elements of IT costs (hardware and software costs) closely during IT adoption process within SMEs. From a same perspective, Walczuch et al. (2000) studying internet adoption barriers for small firms in the Netherlands argue that the high costs are the important reason for Dutch small firms for not having internet access and their own Website. Moreover, most of American businesses have significant difficulty affording the costs of ICT tools while 90% of these businesses consider lack of financial resources and skills as the main barriers to ICT adoption (Duncombe and Heeks, 2001). With regard to the financial constraints of most SMEs, as well as concerning the high start-up cost of ICT or very expensive software or ready-to-use online package, it is expected that SMEs generally cannot afford adopting ICT or reap benefits from it through effective use of ICT in short or medium period of time (Ghobakhloo et al., 2011b; Thong, 2001). Premkumar (2003) however argue that IT adoption cost is not a significant factor in determining

adoption within SMEs. This view is empirically supported through a study by Tan et al. (2009) who discuss that despite IT costs in one of the major risks perceived by Malaysian SMEs, there are no significant associations between high costs of ICT infrastructure and ICT adoption in these businesses. Here, the authors suggest that although the prices of hardware and software have been noticeably decreased and have become more affordable, however, difficulty in estimating costs of IT adoption leading to uncertainty about anticipated IT benefits are a significant barrier to IT investment in SMEs (Love et al., 2005). According to Love et al. (2005), although IT direct costs are resulted from the implementation of new technology, these direct costs are usually underestimated and are regarded as cost of hardware, software and installation, those costs that have been declining recently (Dibrell et al., 2008; Porter and Millar, 1985; Premkumar, 2003), while it is suggested that beside initial costs of software and hardware, costs of IT implementation should include personnel training and development expenses, as well as costs of post implementation (Nguyen, 2009). In addition, indirect costs of IT adoption may be more significant than the direct costs (Love et al., 2005). Indirect costs also comprise the early cost of temporary loss in firm's productivity (Love and Irani, 2004), costs of human factors (e.g. training), organizational costs raised from transformation from former system to new work practice, and costs of any changes to the systems and business procedures (Hochstrasser and Griffiths, 1991), whilst management time is the main considerable indirect cost in various organizations (Love and Irani, 2004). Here, with regard to aforementioned perspectives, it could be inferred that cost is still regarded as an essential issue when it comes to adopting and implementing IT in SMEs (Nguyen, 2009). The rationale behind is that in spite of decrease in initial and direct costs of IT adoption such as costs of hardware, installation and configuration, software and/or licensing in recent years, SMEs, characterized by restricted financial resources are typically experiencing difficulty estimating and affording total and long-term expenses entangled with IT adoption. It should be noted that in addition to direct costs such as hardware, software and installation costs, IT adoption expenses also go beyond indirect costs including costs of staff training and motivation, transformation from old systems, procedures and organizational structure to new ones, as well as post IT implementation expenses, cost of management time and effort, productivity losses, and finally expenses encompassing costs of maintenance and development (Hochstrasser and Griffiths, 1991; Love and Irani, 2004; Love et al., 2005).

In addition, subsequent organizational impact and benefits of an IS/IT could influence IT adoption decision in SMEs. perceived benefits of IT is mostly considered as a managerial belief affecting adoption process, however, we address it here as we aim to inclusively discuss the nature of IT benefits and its impacts over IT adoption and use. As stated previously, perceived benefits, risks, costs and usability of IT affect the acceptance of and satisfaction with IT (Love et al., 2005; Palvia, 1996; Palvia and Palvia, 1999; Thong, 2001). A number of categorization of IT benefits could be found within the rich literature of IT adoption. As stated by Love et al. (2005), authors such as Demmel and Askin (1992, 1996) argue that IT benefits can be categorized as strategic, tactical and pecuniary. On the other hand, other researchers discuss that benefits of IT can be generally classified as three types: strategic, tactical, and operational benefits (Farbey et al., 1995; Irani and Love, 2000 and 2002), however Peters (1994) suggested that IT benefits fall under three classification including enhanced productivity, business expansion and risk minimization. Love et al. (2005) argue that despite the benefits of IT could be evaluated with simpler methods, with the appearance of new inter-organizational systems such as electronic customer relationship management (E-CRM), and ERP, the process of IT benefits evaluation, as well as benefit identification and qualification has become more sophisticated. In general, IS/IT is regarded as a crucial resource required for better communication and integrating business functions (Bhagwat and Sharma, 2007). Gaith et al. (2009) suggest that IT generally improves the overall performances of SMEs. IT could bring about decrease in documentation errors (Ahuja et al., 2009), decline in production and labour costs (Levy et al., 2001; Nguyen, 2009), process and organization flexibility (Ghobakhloo et al., 2011a and 2011b), discovery of new business opportunities and access to market information (Tan et al., 2009), and enhancement of competitive advantage and position of business (Carbonara, 2005; Lai et al., 2006; Pavic et al., 2007; Porter and Millar, 1985; Powell and Dent-Micallef, 1997). Moreover, Thong (2001) pointed out that organizational impacts of IT are characterized as the effects of the IS on the performance of the small business. These authors suggest that IS impacts might be resulted in improvement in decision-making, making more money by adding worth to products and services, and increased sales revenue. Likewise, a study by Riemenschneider et al. (2003) on IT adoption decision in small businesses revealed that anticipated benefits or satisfactory outcomes to organization are significant contributor factor to the decision process of web site adoption. A recent study by Love et al. (2005) on benefits of IT in Australian SMEs investigated benefits of IT based on three different categorizations (strategic, tactical and operational) and found that benefits of IT vary through different industry factors.

In a similar context, a recent study by Tan et al. (2009) on Internet-based ICT adoption within Malaysian SMEs demonstrated that identification of new business opportunities, better access to information and knowledge about market, and finally reliable and quick business communications are three highest ranked benefits of IT adoption by SMEs. However, and most importantly, prior literature goes beyond the direct effect of IT

resources arguing that it is not generic IT, per se, that directly impact relative firm performance, rather, higher-order process capabilities act as the mediators between IT resources and firm performance and provide better justification of IT created benefits (e.g., Benitez-Amado et al., 2010; Bharadwaj et al., 2007). IS-enabled organizational capabilities perspective explains that firm's IS resources can augment critical organizational capabilities, which can result in improved firm performance (Bharadwaj, 2000; Bharadwaj et al., 2007). In this regard, physical and managerial capabilities such as supply chain capabilities (Byrd and Davidson, 2003; Rai et al., 2006; Wu et al., 2006) are some critical organizational capabilities investigated as mediator between IS resources and firm performance. It has been suggested that through the use of related and complementary IS resources and subsequently by creating cross-unit business synergies, IS-based coordination mechanism can be created and organizational capabilities would be enhanced (Tanriverdi, 2005).

On the other hand, it should be considered that in spite of several benefits of IT for SMEs, risk of IT and its consequences could negatively impact organizational profitability and survival. It is imperative to consider the appropriate application for their business when deciding whether or not to implement new IT (Nguyen, 2009). Deficient IT investment decisions can impose significant impact on organizational profitability (Ghobakhloo et al., 2011a). It can participate in enhancing SMEs performance, nevertheless, with no effectual IT adoption and development strategy in right place, the anticipated and demanded performance enhancement may not be materialized and therefore, revealing its counterproductiveness, IT might be considered as an asset sinkhole (Ghobakhloo et al., 2011b). According to Love et al. (2005), IT risk refers to exposure to such outcomes as failure to achieve some, or all, of the anticipated benefits as a result of:

- Implementation costs being higher than expected;
- Technical systems performance significantly below the estimate;
- Incompatibility of the system with selected hardware and software.

Tan et al. (2009) found that high costs of IT tools and expensive software in addition to ICT security concerns are the major risks of ICT adoption perceived by Malaysian SMEs. These findings are consistent with a study by Love et al. (2005) who discuss that "*Security issues, uncertainty about how to evaluate potential benefits of IT, and capital outlay with no guarantee of likely returns*", respectively are three main risks of IT adoption identified in Australian SMEs. With regard to the above mentioned findings, it could be inferred that IT security has become one of the most concern of SMEs when it comes to adopting IT. It is found that according to International Intellectual Property Alliance (IIPA), and owing to insufficient copyright protection over the internet, copyright-based industry, which includes SMEs, has suffered a loss of \$10.7 billion (Kazi, 2007). It suggests that main threats in the use of ICT by SMEs such as security problems and hacking could bring about drastic setbacks to business and their trade and subsequently might result in extreme loss of trust in such trade (Kazi, 2007). Furthermore, Tan et al. (2009) explain that security issues such as sense of insecurity and vulnerability about performing transactions through the internet, as well as the risk of information loss and digital thievery about putting information online are some of the main concerns hindering IT adoption within Malaysian SMEs. As a result, it could be suggested that through passing cyber law by governments to regulate and secure the online transaction activities, and also through providing appropriate anti-virus and/or firewall/security protocols for SMEs by vendors and service providers to prevent and solve the risks of hackers, viruses and spy ware, the perceived risk of IT adoption by these businesses would be alleviated (Tan et al. 2009).

Another influencing factor attributable to the process of IT adoption itself is IS/IT planning. Through IS planning, the chance of successful implementation of IS within small firms might be higher (Thong, 2001). IT planning means that SMEs should determine why and how IT can enhance their business processes and profitability, and then develop a strategy and objectives to obtain the anticipated results (Love et al., 2005). SMEs owner/manages should assign the resources and dedicate significant time and attention to manage adoption process (Sarosa and Zowghi, 2003). They must understand that IT, requesting long-term commitment and sizeable investment, also having high strategic importance can significantly have a major influence over organizational capacity, validity and survival. Planning of IT is perceived to be even more essential with regard to the speed at which technological innovations take place, along with the continuous efforts required by the SMEs' internal environments to absorb them (Thong, 2001). Therefore, SMEs can fully benefit from adoption of IT through IT planning to evaluate the threats and opportunities created by IT (Blili and Raymond, 1993). In addition, IS planning in SMEs, requiring integration with business strategy, has become more crucial as IS becomes more central to the SMEs' future success and growth, and business strategy and IS strategy became intertwined (Levy and Powell, 2000). When IS/IT adoption is not planned strategically, for example when SMEs invest in IS with the aim of only improving production processing and without integrating other systems, IT based competitive advantages are typically accidental rather than planned (Levy et al., 2001). According to

the literature, IS planning includes five phases; financial resources planning, human resources planning, information requirements analysis, implementation (software development, installation, and conversion) and post implementation (operation, maintenance, future needs) (Yap et al., 1994). In addition, a review of IT adoption literature by Ayman et al. (2008) places emphasis on IT projects management arguing that “*highly regarded IT projects can be badly delivered if they are not properly managed*”. Accordingly, short-term strategic decision making cycle and lack of planning in some SMEs may bring about particular problems in implementation of IT (Blili and Raymond, 1993; Rice and Hamilton, 1979). The importance of planning is so central to IT project in order that notwithstanding the popular believe that barrier to IT adoption is mostly because of inaccessibility to funds and technology, the main and recently found barrier among US small business is the lack of information system plan (Arendt, 2008).

On the other side, time-permanency is another characteristic of IT tools which might impact the IT adoption process in SMEs. Salmeron and Bueno (2006) stress that positive role of time-permanency factor in isomorphic application of IT tools is manifested within SMEs; in particular between those belonging to the same industry. A possible explanation for this isomorphism is that most of SMEs managers are interested in old, safe and vastly applied IT solutions, those IT tools that lower risk of failure. It should be considered that the majority of SMEs are facing with limited financial resources (Ghobakhloo et al., 2011b; Nguyen, 2009) and subsequently, deficient IT investment decisions can impose momentous impacts on the organizational profitability or even survival while, investment in newly presented technology often involve a lot of risk and accordingly might imperil SMEs survival (Ghobakhloo et al., 2011a). However, it is imperative for managers to know that pioneers in adopting new information technologies, for example, in the banking industry, pioneer banks in adopting new technology or in developing new applications for existing technologies, are organizations achieving the most benefits from their risky investment (Palvia and Palvia, 1999). Consistent with the resource-based view of the firm suggesting the complementarities of firm resources in value creation (Tippins and Sohi, 2003), and due to wide availability of generic IT in the market, simple IT alone cannot be a source of competitive advantage (Kim et al., 2006), and adoption of state-of-the-art IT applications ahead of competitors will make IT resources firm specific and imperfectly mobile across firms, providing the adopting firm with additional business value not achievable by late users (Wu et al., 2006).

Organizational characteristics

Numerous studies carried out on the adoption of IS/IT within SMEs have revealed a number of organizational characteristics affecting adoption process including SMEs’ strategies, business size, type of industry, information intensity, organization culture and technological maturity (Acar et al., 2005; Caldeira and Ward, 2003; De Burca et al., 2005; Drew, 2003; Levy et al., 2001; Love et al., 2005; Mole et al., 2004). Strategically, IT tools are employed within SMEs in order to achieve pre-determined business strategy, therefore, SMEs’ investments in IT are strongly affected by their strategic context such as cost reduction versus value added strategies (Levy et al., 2001). According to Nguyen (2009), many businesses adopt new IT just for rivaling with other SMEs which have implemented these technologies. This author argues that under such circumstances, lack of definition or strategy of the purposes of IT adoption will lead to project failure. In addition, a study by Lybaert (1998) of 208 Belgian SMEs found that SMEs having minor family ownership and less intervention in strategic management as well as owner/managers with a greater strategic awareness will use higher information.

According to the prior literature on IT adoption in SMEs, business size definable by turnover and/or number of employees is one of the most important determinants of IT adoption (Fink, 1998; Love et al., 2005; Premkumar, 2003; Premkumar and Roberts, 1999; Thong and Yap, 1995). The importance of firm size is partly because of its role as the source of firm’s capabilities (Mole et al., 2004). Another reason however is the fact that firm’s resources including financial and human capital might be an approximation of firm size (Thong, 1999). Thong and Yap (1995) survey points out that business size is the most important discriminator between adopters and non-adopters of IT within Singaporean small businesses. Likewise, an investigation by Premkumar and Roberts (1999) of rural small businesses revealed that even within the small business category, firm size is the most important determinants to the adoption of IT. This finding is reinforced by a study of Premkumar (2003) on IT adoption within 207 SMEs who indicate that larger firms in the small business group have a higher inclination to adopt communication technologies than smaller ones. In addition, Acar et al. (2005), studying use of ICT by SMEs in Turkish building construction discuss that as firm size becomes larger, higher impact of ICTs on construction performance will be perceived by building contractors. Likewise, concerning the level of usage of ICTs; these technologies will be used more intensively by contractors in many fields. This view is supported through a recent study by Ahuja et al. (2009) who demonstrated that; defining SMEs size in term of annual turnover, Indian construction SMEs possessing higher turnover will have higher ICT adoption. These authors discuss that these businesses do not perceive initial costs of IT set-up and IT infrastructure updating expenses as

the major barriers to effective IT adoption while these costs have been perceived as major barriers by other SMEs. Conversely, these results are inconsistent with a study by Gremillion (1984) on the size of organizations and IS usage which demonstrated that there is insignificant relationship between sizes of organizations and IS use. An investigation by Love et al. (2005) of IT investments from 130 SMEs in Australia have also shown that organizational size in terms of both turnover and number of employees has not affected IT investment levels among SMEs.

Another organizational characteristic that affect the adoption of IT in SMEs is specification of industry sectors that they belong to. Prior literature provides support for type of business and information intensity as determinants of IT adoption in SMEs (Ghobakhloo et al., 2011a). IT is suggested that consistent with other researches on IT adoption in different countries such as US, Malaysia or Singapore, IT adoption in Bruneian SMEs is significantly affected by type of business (Seyal, 2000). Likewise, it has been reported that structure of IS/IT in organizations is considerably influenced by the types of business. Salmeron and Bueno (2006) hypothesized that SMEs in a same industry sector tend to implement the similar IS/IT, have similar attitudes towards technological changes and have personnel with the similar attitudes toward using new technology. Porter and Millar (1985) suggest that the importance and the role of IT in various industry sectors are different due to type of company and information intensity. This view is reinforced by Love et al., (2005) who demonstrated that the level of IT investment made by Australian SMEs form different industry sectors will be significantly different. consistent with these views, Thong and Yap (1995) suggest that companies from different industries have dissimilar information processing requirements and those SMEs in more information-intensive sectors might have more propensity to adopt IT than those in less information-intensive environment. Similarly, Malaysian service industries are making more use of IT and are more integrated with the IT in comparison to distribution and manufacturing firms as they are active in more information intensive environment (Valida et al., 1994). Drew (2003) suggests that the high-tech/knowledge intensive SMEs are considerably more influenced by internet technologies than other types of firms, as well as are more sophisticated in use of internet technologies. Their study also found that high-tech SMEs are highly regarding internet as supporting force of future growth. Thus, SMEs must assess their IT maturity to determine their IT readiness and whether the available IT tools could be satisfactorily implemented regarding the current organizational and environmental conditions (Sarosa and Zowghi, 2003).

Organizational change is another significant influencing factor over IT adoption. Business growth forces SMEs to adopt novel and more effective technological solution (Bruque and Moyano, 2007). The use of ICTs in small firms is because of many internal factors such as business expansion, down-sizing or relocation, and finding and captures new markets which bring about change in organizations. Owner/managers may regard IT or ICTs as an essential tool to help managing changes (Southern and Tilley, 2000). This view is supported by Drew (2003) who demonstrated that industry changes and trends and opportunities for growth are some of the major driving forces pushing SMEs toward adoption of IT. Consistent with these views, Bruque and Moyano (2007) explain that since in SMEs, in particular within family ones, the concept of business growth requires and is associated with deployment of total quality system and professionalization processes as well, IT adoption might be regarded as a rational response to these alterations from managers. In the light of aforementioned findings, it could be suggested that change management could have significant impact over decision to adoption IT (Ayman et al., 2008). Company-wide change management program is required to train employees to accept change and operating in an entirely new way; otherwise they will be caught by “competitive convergence” and finally defeated by their competitors (De Burca et al., 2005). Here, it should be noted that IS/IT implementation in SMEs may require organizational and structural changes (Levy et al., 2002; Markus and Robey, 1988), change in existing work practices or culture of organizations (Nguyen, 2009) while these requirements can be simplified regarding SMEs’ simple organizational structure (Lin, 1998). Since SMEs typically have simple and highly centralized structures with the chief executive officers, this centralization might be regarded as an enabler and success factor in adoption and implementation of IS in SMEs through decreasing complexity. Supporting this view, Blili and Raymond (1993) suggest that *“One particular advantage of a simpler structure is that it should facilitate the tasks of needs identification and tailoring of the IS to the firm's strategy, which basically emanates from the owner-managers”*. Currie (1996) comprehensively studied the relationship between structure and the use of IT by conducting a survey and review of literature and suggested that structural incompetencies of organizations may negatively influence how IT is utilized. As a result, and with regard to the fact that huge amount of financial investment in IT is typically unsupported by existing structural or strategic initiatives, organizational restructuring might thus develop the level of effectiveness and usage of the IT resource (Currie, 1996; Davenport and Short, 2003). Furthermore, Currie (1996) concludes that restructuring IT services in organizations into centralized structure will lead to improvement in levels of IT services and decrease in operation costs since differentiation and decentralized IT structure may result in poor service levels, decreased management control, and increased business costs. However, it should be noticed that this view is more

acceptable to large organization, those usually have a IT or management information systems (MIS) department while, having limited resources, SMEs users deal with the all spectrum of IT instead of MIS or IT department (Palvia, 1996).

In addition, organizational culture in another significant determinant of IS/IT implementation in organizations (Bruque and Moyano, 2007; Cooper, 1994; Kanungo, 1998; Riolli and Savicki, 2003). A number of organizational culture definitions can be found within the body of literature. According to Carmeli et al. (2008), Hofstede et al. (1990), Jones et al. (2005), and Stewart et al. (2000) there is no clear and unanimous definition of organizational culture. However, Jones et al. (2005) stress that Schein's (1990) definition of organizational culture have been used by various researcher in area of IT adoption. This three dimensional view explains that organizational culture consists of three concepts: assumptions, values, and artefacts (Schein, 1990). Marquardt (2002) defines the culture as "*an organization's values, beliefs, practices, rituals, and customs*". Based the definition of Hodges and Hernandez (1999) "*culture in organizations can be thought of as the beliefs, values, and meanings shared by members of an organization*". Culture can also be regarded as the way of doing and sharing things for individual through complying firm's beliefs values, and attributes (Nguyen, 2009) or can be defined as indigenous characteristics of organization including level of openness to change and characteristics of human resources (Hall et al., 2001). Stewart et al. (2000) suggest that characterizing of organizational culture is necessitated since the culture and its various impacts are the key to success of IT projects (e.g. ERP, those projects that are entangled with significant organizational change. These authors argue that many ERP failures can be attributed to paying inadequate attention to the culture of the organizations while it is imperative to notice that in most of the time, 'desired' and the 'actual' organizational culture are differentiated (Bliss, 1999). In light of organizational readiness to change, Jones et al. (2005) suggest that organizational culture having more supportive climate and flexible structures might be more advantageous to successful deployment of new technologies in organizations than less flexible and mechanistic cultures. In addition, constructs of organizational culture including perceived norms, values, and attitudes predominant in organizations might affect the behavior of employees toward ICT in organizations (Carmeli et al., 2008). Regarding these findings, Jones et al. (2005) assert that employees perceiving the culture of their organization as open system are more inclined to have positive attitude toward organizational change and subsequently will perceive more readiness for changes before deployment of new technology in organization. These authors demonstrated that employees who perceive strong human relations values in their area have shown higher readiness for change prior to the deployment of the new computing system.

In SMEs, culture is highly affected by owner/manager attitude, perceptions and characteristics (Nguyen, 2009). Thus, it is imperative for managers to know that employees' usage of ICT might be affected by supervisors' (managers in different levels) behavior toward work and IT (Carmeli et al., 2008). Moreover IT conflict with organizational culture can result in user resistance to IT adoption (Cooper, 1994). Culture in SMEs can be defined as internal factor including individuals' (firm's human resource) characteristics and levels of openness to change (Minguzzi and Passaro, 2001). Nonetheless, Graham and Nafukho (2007) ascertain that small businesses should be regarded as organism influenced by both internal and external factors in order to clearly understand their culture. A study by Kanungo (1998) on organizational culture and network-based computer use in both large and small organizations demonstrated that user satisfaction with information system use is significantly affected by both dimensions of organizational culture; task-oriented culture and people-oriented culture. This view is empirically reinforced by Jones et al. (2005) who found that success of IS in organizations which is measured by user satisfaction and system usage is significantly affected by types (human relations, open systems, internal process, and rational goal) and dimensions (character, leadership, cohesion, emphases, and rewards) of organizational culture. As stated previously, openness to change is an important characteristic of organization culture (Hall et al., 2001; Minguzzi and Passaro, 2001). Thus, and in light of the fact that IT deployment will often bring about significant change in SMEs, the authors suggest that SMEs possessing adaptable and flexible organizational culture with higher levels of openness to change will be more inclined and prepared to accept IT-related changes, those changes that might result in IT project success (Arroyo et al., 2007; Nguyen, 2009; Riolli and Savicki, 2003). From the other point of view, it is suggested that the examination of SMEs culture should also be addressed through studying organizational learning and the learning organization pattern (Graham and Nafukho, 2007) since interrelationship between SMEs' culture and learning process might be resulted in enhancement of firm's competitive capacity (Minguzzi and Passaro, 2001). Newell et al. (2000) suggest that knowledge required for adoption of complex IT projects which is vastly distributed need to be integrated within the organization through a process of networking and knowledge sharing, while the effectiveness of this process is rooted in SMEs culture. Moreover, the adoption process requires the integration of internal and external knowledge within the firm.

Furthermore, Family involvement and intervention in firm management could have significantly impacts upon IT adoption (Bruque and Moyano, 2007; Lybaert, 1998). It has been largely confirmed that in family businesses, the tenure of senior managers which are members of family is much higher than those in non-family organizations (Davis, 1993; Jorissen et al., 2005; Moores and Mula, 2000). According to Jorissen et al. (2005), family firms' managers are less inclined to have higher educational level than those in non-family firms. Family firms have also been characterized by smaller management team while larger management team can be resulted in more effective business management (Van den Berghe and Carchon, 2002). However, this view is not consistent with the results of studies by Smith (2007) and Westhead et al. (2001) who found that there is no significant difference between family and non-family business in term of size of management team. Nevertheless, Smith (2007) provided evidence that size of firm is dominant determinant of managerial differences since these differences between micro, small and medium enterprises have been found to be more significant than between family and non-family businesses. In light of above mentioned findings, as well as, contingent upon the characteristics of family businesses such as lack of professionalization, more informal organizational structures, and relying on informal internal control systems, the objective of IT adoption as well as implementation process might be highly different in family SMEs (Bruque and Moyano, 2007; Smith, 2007). In addition, involvement and intervention of family members in day-to-day activities and management of family business may bring about organizational issues where in most small businesses, family members are being hired to possess vital positions (Bruque and Moyano, 2007; De Lema and Durel ndez, 2007; Lybaert, 1998; Smith, 2007). Compare to hiring external staffs that are better fitted for positions in the business, family members' non-qualification often results in management problems such as ineffective IT usage (Nguyen, 2009). A study by De Lema and Durel ndez (2007) on managerial behavior of small and medium-sized family businesses found that when SMEs are managed by family members, in addition to the lack of importance to personnel training and management qualifications, commitment to family well-being might be resulted in inefficiency in the decision making process. Moreover, in some family SMEs, more informal organizational structure and lack of professionalization, and using more autocratic management method may impede the proper management of IT adoption process (Bruque and Moyano, 2007). Likewise, an empirical study by (Lybaert, 1998) found that less significant family ownership and intervention in strategic management, higher level of information use in SMEs is anticipated.

3.2 External factors

External and competitive pressure

For many firms, pressures to keep up with the competition, providing a means to enhance survival and/or growth, managing changes, promoting services to customers, and staying competitive and/or enhancing innovation abilities have forced SMEs to adopt IT (Drew, 2003; Mole et al., 2004; Nguyen, 2009; Premkumar, 2003; Premkumar and Roberts, 1999; Riemenschneider et al., 2003). Prior literature suggests that as small businesses are susceptible to customer pressure, these firms adopted IT as a result of demand from customers to develop the efficiency of their inter-organizational dealings (Levy et al., 2003). Hence, it has become an indispensable strategy for firms to have these technologies (Premkumar and Roberts, 1999) while others suggest that the main driving forces to move toward IT tools in SMEs are internal factors including industry changes and trends, maintaining current market, finding new market, opportunities for growth and the necessity to keep up with competition (Drew, 2003; Southern and Tilley, 2000). Nguyen (2009) argues that firms move toward adoption of IT for dissimilar reasons due to various functions of firms in different environments and their operation in different ways. According to their study, firms' movement to IT is:

1. In response or reaction to an event;
2. In response to the pressures from the internal and external environment;
3. Resulted from the pressure from customers and emphasis on improving efficiency.

A more inclusive view on the innovation literature draws attention to relevancy and importance of both internal and external drivers for change (Morel and Ramanujam, 1999; Siggelkow and Levinthal, 2005). Mehrtens et al., (2001) discuss that issue of credibility has risen as a significant motivator for adopting IT tools within SMEs. These authors argue that this credibility could be achieved through fulfilling customers and suppliers' pressure and significantly their expectation of receiving better services as well. A study by Dutta and Evrard (1999) on European small enterprises shows that the main focus of European small enterprises is to make use of IT to deliver a superior level of customer service and better communication with distant partners/customers. Moreover, a study by Premkumar and Roberts (1999) on rural small businesses suggests that external pressure and competitive pressure are important determinants to the adoption of ICTs. Likewise, it is suggested that clients and suppliers pressure to adopt IS/IT is an important factor influencing the levels of IS/IT adoption and success in Portuguese manufacturing SMEs (Caldeira and Ward, 2003). These results are consistent with studies

by De Burca et al. (2005) and Mole et al. (2004) who suggest that customers, suppliers and larger counterpart demand are significant determinant of IT tools adoption.

On the other hand, and according to prior IS literature, drivers for IT/IS adoption in SMEs are also attributable to the firms' desire and need to stay competitive and innovative as necessity for their survival (Ghobakhloo et al., 2011a). The expression "competitive advantage" is one of the most lasting topics in the business strategy and strategic management literature and its theories have been well-founded (Barney, 2000; Dierickx and Cool, 1989; Porter, 1986; Porter, 1998). Porter (1986) defines competitive advantage as a direct consequence of the strategies implemented by a firm intended for adding value to customers. It has been demonstrated that the competitive pressure will affect the adoption of new technologies when SMEs perceive that these technologies possibly will support their competitive position, therefore, SMEs adopt IT to gain competitive advantage (Ghobakhloo et al., 2011b). Porter and Millar (1985) argue that nature of competition might be change through adoption of IT. They found that IT has changed the rules of competition through changing the industry structure, creating competitive advantage by delivering businesses new ways to outperform their competitors, and spawning new businesses by making new businesses technologically feasible, creating demand for products and regenerating old businesses. SMEs active in industries having high rate of innovation and intense competitive challenge are probable to perceive IT tools as a stronger driver for strategic change than those in other types of industries (Drew, 2003; Gunasekaran et al., 2000; Migiro and Ocholla, 2005; Premkumar and Roberts, 1999; Tye and Chau, 1995). The study by Pontikakis et al. (2006) investigating IT adoption within Greek SMEs suggests that highly competitive industries are often technologically intensive and SMEs operating in innovation-intensive industries might face intense competition initiated by innovations those are generally inclined to be more risk-averse. These authors found that SMEs which perceived their industries as highly competitive were more than six times more probable to adopt IT solutions. IS/IT utilization could brings about more effective SMEs both internally and externally, so SMEs consider IT as a essential tool with the purpose of compete for the organizational adaptation as well as environmental changes (Ghobakhloo et al., 2011a). Furthermore, IS/IT enhances SMEs survival rate where they are functioning in a competitive environment with higher rate of failure risk (Levy et al., 2001). Nevertheless, Thong and Yap (1995) disagree with this view and suggest that competitiveness of the environment and information intensity do not directly affect the decision of Singaporean small businesses to adopt IT since in their study, small businesses those have implemented IT do not adopt it as a result of their environment. From the other perspective, a recent study by Loukis et al. (2009) suggests that since IT tools (hardware, packaged software and networks) are obtainable to competitors as well, they cannot offer a sustainable competitive advantage (SCA). So, SCA could be achieved through IT combination with other resources and capabilities of the firm. This argument supports an empirical study in the retail industry by Powell and Dent-Micallef (1997) who found that IT alone cannot afford sustainable performance advantages, but rather competitive advantages can be attained only through using IT and its integration with the firm's infrastructure of human and business complementary resources. Here, it should be considered that if SMEs do not perceive the relative advantage of IT for their business comparing to their competitors, they may be reluctant to adopt IT (Sarosa and Zowghi, 2003).

External IT consultant and vendors

There is a body of research that show assistance of external IT expertise, consultants, and vendors, and their quality is one of the most important aspects of the IT adoption process within SMEs (Ghobakhloo et al., 2011b). Their professional abilities could have positive impacts upon IT adoption process while most SMEs are suffering from lack of IT experts and hiring external consultants (Gable, 1991; Morgan et al., 2006; Nguyen, 2009; Premkumar and Roberts, 1999; Soh et al., 1992; Thong, 2001; Walczuch et al., 2000). Cragg and Zinatelli (1995) pointed out that lack of internal expertise has seriously hindered IS sophistication and evolution within small firms, therefore, they must overcome this problem through either seeking help from external sources or developing their own internal end-users' computing skills (DeLone, 1981). Shin (2006) found that SMEs are moving toward adoption of enterprise application (EA) software to survive in competitive global market while consultant often have greater share in providing EA than vendors (e.g. up to 60% of ERP project cost is devoted to services provided by outside consultants). According to the Thong et al. (1997) and Thong (1999), external consultants and vendors are main sources of external IS expertise regarding IS implementation within small businesses. They suggest that there are some advantages to hiring a consultant in place of employing an internal IS employee;

- There will be no necessity to pay for expensive employees when IS deployment is done;
- Expensive professional training for system analysts and professional programmer for system maintenance will not be needed;
- It is hard to employ rare qualified system analysts and programmers attributable to limited career advancement prospects in a small business;

- Increasingly sophisticated technology requires the engagement of various specialists, which is not possible for a small business.

From a similar perspective, Gable (1991) cited that small businesses seek external IS assistance with a diversity of objectives:

- Saving through cost cutting study or avoiding hiring full-time staff;
- Improving the chances of successful computer usage through increasing computer knowledge or abating lack of knowledge by use of external expertise;
- Handling increasing complexity of managing and outlasting competitively in global markets.

Owing to the importance of external assistance to SMEs, these business are facing difficulties as IT vendors often devote their marketing at larger organizations and generally do not understand SMEs' unique needs (Stockdale and Standing, 2004). Consequently, if powerful technology suppliers develop their marketing strategies and become more aware of issues including quality, training provision, and maintenance regarding SMEs' needs, this will encourage SMEs to implement IT for improving their performance (Southern and Tilley, 2000). In general, The duties of external expertise comprise IS project management, encouraging employees to accept new system and overcome fear of new technology, fulfilling information requirements analysis of business needs, IS user training, and recommending suitable computer hardware and software (Thong and Yap, 1995; Thong et al., 1997). These external consultants act as intermediaries to compensate for the absence of IT knowledge in SMEs and diminish the IS knowledge barrier to successful and effective IS/IT implementation (Thong, 2001). Cragg and Zinatelli (1995) argue that although lack of internal expertise seriously has hindered IS sophistication in small business and small business are heavily depend on outside sources for technical expertise, there are some possible reasons for SMEs not seeking external help including;

- Firms perceive that they cannot afford the external support;
- Firms do not possess sufficient internal expertise to make an informed choice about taking advantage of external support;
- Firms perceive lack of trust in outside sources and deficient service;
- Firms observe that any training or advice seeking needs a time commitment while time is a restricted resource in the small firm.

It is crucial for management to consider the fact that external supports provided by vendors are essential for SMEs having no sufficient IT expertise to implement these new technologies (DeLone, 1981). A study by Soh et al. (1992) of 96 Singaporean small businesses revealed that level of IS usage within small businesses hiring consultants is higher than those of small businesses without consultants. This result is reinforced by Thong et al. (1997) who demonstrated that SMEs with high levels of external IS expertise have higher level of IS effectiveness. In the similar context, effectiveness of external expertise is also an influencing factor of process of IT adoption within SMEs (Fink, 1998; Morgan et al., 2006; Thong, 2001). Thong (2001) study revealed that small businesses with higher level of IS consultant effectiveness have higher level user satisfaction and overall IS effectiveness. In fact, the use of ICT among SMEs is also affected by marketing strategy of ICT suppliers (Southern and Tilley, 2000). These views are sported by Caldeira and Ward (2003) who suggest that IS/IT vendors' support is an important factor influencing IT adoption success within SMEs.

Based on the above-mentioned viewpoints and studies, the authors conclude that regarding lack of IT knowledge and internal IT/IS experience and skills, SMEs could fill this gap of knowledge through using external assistance such as engaging external expertise and use of vendor assistance. The authors suggest that because of unique characteristic of SMEs knowing as resource and financial poverty, SMEs should precisely consider the financial resources available for hiring external consultants since they generally entail considerable expense. Moreover, it should be considered that external expertise' recommendations and suggestions may not be always practical to and fit with SMEs' requirements if strategies and objectives of businesses is not sufficiently clear to understand. As a result, a clear objective and definition of new IT implementation within SMEs seems to be necessary (Nguyen, 2009).

Government

According to the literature, the significant positive relationships could be found between IT adoption and government support (Ahuja et al., 2009; Southern and Tilley, 2000; Tan et al., 2009; Yap et al., 1994). Because of their size and lack of resources, SMEs are generally more dependent than other companies on external resources and supports (Sarosa and Zowghi, 2003). According to Fink (1998), government support for facilitating information transfers to SMEs is incrementally increasing. This author argues that these transfers are fundamentally accomplished through networks, usually informal (e.g. membership of the Small Enterprise Association of Australia and New Zealand), however sometimes formal. Government initiatives and policies

could directly and/or indirectly stimulate the development of IT infrastructure and information provision to energize faster technology diffusion (Ghobakhloo et al., 2011a). Nevertheless, the literature suggests that governmental assistances are generally not advantageous. A study by Dutta and Evrard (1999) on small businesses in six different European countries indicate that despite governments have tried to assist SMEs in adopting IT through increasing public spending on technology projects, in a campaign to improve innovation and reinforcing the performance of companies, there are adoption barriers in the governmental agencies' mechanisms to help these businesses. This unsuitableness is attributable to the gap between what is really required for SMEs and what is provided by the government (Sarosa and Zowghi, 2003). This result is supported by a study by Yap et al. (1994) of computerization experience of 40 small businesses computerizing through the government incentive program with that of 40 small businesses which have computerized without government assistance, which shows that participation in a government computerization program has not resulted in more effectual IS, however, this program has encouraged small businesses which suffer from lack of financial resources and technical expertise to computerize their operations. From a similar perspective, Fink (1998) study found that government grants does not appear to be a significant factor supporting IT adoption within Australian SMEs.

Despite above mentioned results show that government assistances haven't generally found to be helpful, recent studies, particularly in developing country have revealed that IT adoption in SMEs have been significantly improved through government policies and initiatives. In light of this view, Fathian et al. (2008) explain that Iranian government plan of ICT development (TAKFA) has resulted in significant improvement in IT adoption and e-readiness within Iranian SMEs. From a similar perspective, a recent study by Tan et al. (2009) found that in Malaysia, SMEs generally disagree with this view that cost is significant determinant of ICT adoption. These authors discuss that since most of SMEs are aware of financial supports and incentives provided by government, ICT costs is not regarded as major barrier by Malaysian SMEs. This view is empirically supported by Alam and Noor (2009) who demonstrated that ICT adoption in Malaysian SMEs is not directly affected by perceived ICT costs. According to these authors, the rationale behind is that all types of financial supports to these businesses have been provided by government for ICT adoption. For example, Malaysian SMEs do not perceive the costs of training required for successful IT adoption as a barrier since the government agencies have provided and offered a number of necessary training programs (Tan et al., 2009). As a result, it could be concluded that; with regard to the supportive policies and comprehensive IT support provided by Malaysia government, for example through Malaysian Technology Development Corporation, Multimedia Super Corridor (MSC), newly established SME Bank and Small and Medium scale Industries Development Corporation (SMIDEC), the IT adoption process seems to be considerable simplified for Malaysian SMEs (Alam and Noor, 2009; Tan et al., 2009).

4. CONCLUSION, SUGGESTIONS AND FUTURE RESEARCH

IT has critically become indispensable tool for daily operations of organizations. SMEs are now investing significant amount of financial resources in IT to strengthen their competitive positions (Premkumar, 2003). Due to large-scale application of IT among SMEs, they have been exposed to several associated risks within the adoption and development of IT solutions (Kazi, 2007). Prior literature on IT adoption in SMEs show that approximately most of failures and dissatisfaction were the result of one or more of the subsequent reasons (Arendt, 2008; Caldeira and Ward, 2003; Cragg and King, 1993; Cragg and Zinatelli, 1995; Levy et al., 2001; Lybaert, 1998; Nguyen, 2009; Qureshi and York, 2008; Sarosa and Zowghi, 2003; Tarafdar and Vaidya, 2005; Thong and Yap, 1995):

- Inappropriate connection of adopted IT to the enterprise strategies;
- Inadequate realization of organizational issues;
- Inadequate realization of end users necessities;
- Lack of required resources (knowledge, skills, financial, managerial);
- Inadequate teaching and preparation of end users;
- Business size and fund limitations to employ IT specialists;
- Unqualified management in highly centralized CEO structures;
- Inappropriate government assistance role and supportive regulation;
- Dissatisfaction with IT created competitive advantages due to improper interactions with competitors, suppliers and customers;
- Particular characteristics of organization, culture, and family involvement in business.

Toward a better understanding of an appropriate way to well organized deployment and efficient application of IT, SMEs must precisely realize their need for it and proportionate advantages of IT for their business. SMEs ought to judge costs and benefits associated with utilizing IT. In addition, they should find out existing

obtainable external aid and incentives supplied by government related agencies, advisors, vendors, and their counterparts; those external sources that might assist them with adopting IT. SMEs need to consider what predictable impacts could be imposed by adopting IT on their business situations, customers, supplier, competitive position as well as their competitors. Thus, SMEs have to consider these expressed drivers, barriers and issues that might affect the successful adoption of IT solutions. It is imperative that SMEs should precisely evaluate their capability to reap benefits from IT adoption and do not underestimate it. They should know that IT has competence to act as a strategic tool to assist them to compete with their larger counterpart in the globalized market (Tan et al., 2009). However, it should be considered that deficient IT investment decision and imprecise IT adoption strategy may imperil the survival of businesses Ghobakhloo et al., 2011a).

In addition, and as suggested in literature, external assistance is imperative for successful IT implementation in SMEs since these businesses are generally suffering from lack of IT knowledge, skills and training resources (Chau, 1995; Cragg and Zinatelli, 1995; Fink, 1998; Igbaria et al., 1997). As a result, external consultants and vendors are main sources of external IT knowledge and skills in SMEs (Thong et al., 1997). Accordingly, higher levels of external consultants and vendor effectiveness and support will be resulted in increase in IT effectiveness in SMEs (Chau, 1995; Thong, 2001). Nevertheless, regarding the fact that SMEs typically do not have sufficient financial resources to afford costs of hiring external experts and IT training campaigns expenses, as well as concerning this fact that some SMEs do not trust in using the assistance of external expertise and consultant (Caldeira and Ward, 2003; Igbaria et al., 1997; La Rovere, 1998; Nguyen, 2009), the role of governments support and initiatives to help and encourage to adopt IT is much more significant in the context of SMEs (Southern and Tilley, 2000; Tan et al., 2009). According to the literature, it could be suggested that it is very important that governments precisely consider what is demanded to support IT adoption in SMEs to avoid the gap between supports provided by government and what is really required for SMEs (Sarosa and Zowghi, 2003). Moreover, in spite of some reports of governmental disadvantageous and ineffective assistances, a number of studies have demonstrated that IT adoption in SMEs has been significantly improved through supportive policies and initiatives provided by both developed and developing governments, especially in recent years, thus, governments should provide a comprehensive policies and supports to encourage small and medium enterprises to develop and use IT, those should be periodically re-evaluated regarding the dynamic characteristics of SMEs, IT tools and dynamism of global economy, and market conditions.

Prior IT literature suggests that endless variety of conducted studies in the case of IT adoption have intended to gain clear understanding of numerous pitfalls and challenges associated with IT adoption awaiting SMEs, as well as evaluation of factors affecting successful deployment of IT. The authors categorized influencing factors into two main groups which are internal factors and external factors. Internal factors include top management, firm's resources, end users, IT solution itself, and organizational characteristics while external factors comprise external and competitive pressure, external IT consultant and vendors, and government. The author believes that the presented categorization of IT adoption issues and SME-related factors through developed integrated framework can help organizations, managers and IT consultants to achieve clearer understanding of IT adoption influencing factors, and also add further knowledge to the literature. Although we inclusively discussed that how distinguished influencing factors affect the IT adoption decision, acceptance, satisfaction, and usage, we did not categorized the reviewed influencing factor in term of different adoption concepts, the issue which can be addressed by future research. This paper might not cover all aspects of IT adoption process in the literature. Likewise and based on unique characteristics of each organizations and its specific conditions of technological innovation diffusion, it has not been claimed that this framework is applicable for all firms and is able to deal with all of their issues. For this reason, these findings require empirical testing to determine its relevancy and conformity in a practical environment. In addition, more comprehensive study of IT adoption within SMEs investigating SME-related influencing factors simultaneous with other aspects (drivers, enablers and inhibitors) of IT adoption seems to be necessary.

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TABLES AND FIGURES

Table 1: Factors affecting IT adoption in SMEs

Internal factors		
Influencing factors	Factors	References
Top management (CEOs)	Perception of and attitude toward IT adoption such as urgency, benefits and costs	Caldeira and Ward, 2003; Qureshi and York, 2008; Thong and Yap, 1995
	CEO support and commitment	Cragg and Zinatelli, 1995; Drew, 2003; Premkumar, 2003; Premkumar and Roberts, 1999; Thong, 2001; Thong et al., 1993; Thong et al., 1997
	IT knowledge and experiences	Drew, 2003; Fink, 1998; Lybaert, 1998; Seyal et al., 2000; Thong and Yap, 1995
	CEO innovativeness	Thong and Yap, 1995
	Perceived behavioral control over IT	Qureshi and York, 2008
	CEOs desire for growth	Lybaert, 1998
	Familiarity with administration	Lybaert, 1998

Resources	Financial resources availability level of IT investment In-house IT experts	Caldeira and Ward, 2003; Lybaert, 1998; Mole et al., 2004; Riemenschneider et al., 2003 Dutta and Evrard, 1999; Thong, 2001 Chau, 1995; Cragg and Zinatelli, 1995; Fink, 1998; Southern and Tilley, 2000
End users (staff)	Users' qualifications (knowledge of IT) Users' training Users' attitudes and opinions toward IT Users' participation and involvement	Alam and Noor, 2009; Caldeira and Ward, 2003; Thong, 2001 Chau, 1995; Dutta and Evrard, 1999; Premkumar and Roberts, 1999 (Caldeira and Ward, 2003; Chau, 1995) (Bruque and Moyano, 2007; Fink, 1998; Lybaert, 1998; Thong, 2001)
IT solution computer application)	Type and age of implemented IS/ITs Quality of software available in market The costs of ITs Perceived impacts and benefits of IS/ITs on organization Process compatibility IS planning User-friendliness, complexity and popularity Security	(Caldeira and Ward, 2003; Salmeron and Bueno, 2006; Shin, 2006) Caldeira and Ward, 2003 Chau, 1995; Fink, 1998; Tan et al., 2009; Walczuch et al., 2000 Alam and Noor, 2009; Drew, 2003; Poon and Swatman, 1999; Premkumar, 2003; Premkumar and Roberts, 1999; Riemenschneider et al., 2003; Tan et al., 2009; Thong, 2001 De Burca et al., 2005; Premkumar, 2003; Premkumar and Roberts, 1999; Tan et al., 2009 Thong, 2001 Chau, 1995; Palvia, 1996; Premkumar and Roberts, 1999; Tan et al., 2009; Yan et al., 2007 Kazi, 2007; Love et al., 2005; Tan et al., 2009
Organizational behavior and characteristics	Business growth and expansion SME's strategic context Business size (turn over and number of employee) Type of industry Information intensity Business maturity (high tech and knowledge intensive) Organizational structure Organization culture Family intervention on management	Andries and Debackere, 2006; Bruque and Moyano, 2007; Drew, 2003 Caldeira and Ward, 2003; Levy et al., 2001; Lybaert, 1998 Acar et al., 2005; Dutta and Evrard, 1999; Fink, 1998; Gremillion, 1984; Love et al., 2005; Mole et al., 2004; Premkumar, 2003; Premkumar and Roberts, 1999; Seyal et al., 2000; Thong and Yap, 1995 Drew, 2003; Love et al., 2005; Pontikakis et al., 2006; Salmeron and Bueno, 2006; Thong and Yap, 1995 Seyal et al., 2000; Thong and Yap, 1995; Valida et al., 1994 Drew, 2003; Lybaert, 1998 Caldeira and Ward, 2003 Bruque and Moyano, 2007; De Burca et al., 2005; Fink, 1998; Kanungo, 1998; Nguyen, 2009 Bruque and Moyano, 2007; Lybaert, 1998; Nguyen,

	Change (technological change and business expansion)	2009 Mole et al., 2004; Southern and Tilley, 2000
	Integration of internal processes	De Burca et al., 2005
External factors		
Competitive environment (competitors)	Business, social, and market pressure to adopt IT	(Caldeira and Ward, 2003; Riemenschneider et al., 2003)
	Competitiveness of environment (the necessity to stay competitive)	Drew, 2003; Mole et al., 2004; Pontikakis et al., 2006; Premkumar, 2003; Salmeron and Bueno, 2006; Thong and Yap, 1995
	Capturing new markets	Southern and Tilley, 2000
Government	Legal issues	Fathian et al., 2008; Kazi, 2007
	Government policies (aids and supports)	Alam and Noor, 2009; Dutta and Evrard, 1999; Fink, 1998; Seyal et al., 2000; Southern and Tilley, 2000; Tan et al., 2009; Yap et al., 1994
Customers and supplier	Customers and supplier pressure for IT adoption (to deliver higher level of customer service and communicate)	Dutta and Evrard, 1999; Riemenschneider et al., 2003; Southern and Tilley, 2000
	Customers demand to adopt IT	Ahuja et al., 2009; Alam and Noor, 2009; De Burca et al., 2005; Kirby and Turner, 1993
	Larger counterpart demand	Alam and Noor, 2009; De Burca et al., 2005; Fulantelli and Allegra, 2003; Poon and Swatman, 1999
External IT consultant and vendors	External expertise and services availability and support	Caldeira and Ward, 2003; Chau, 1995; Cragg and Zinatelli, 1995; Fink, 1998; Premkumar and Roberts, 1999; Thong et al., 1997; Walczuch et al., 2000
	Consultant effectiveness and competence	(Fink, 1998; Morgan et al., 2006; Thong, 2001; Thong et al., 1997)
	Strategies of private technology suppliers	Southern and Tilley, 2000

Table 2: Thong et al. (1997) definition of top management support

Variables	CEO support elements
Top management support	frequency of attendance at computerization project meetings level of involvement in information requirements analysis level of involvement in decision making relating to the computerization project level of involvement in reviewing consultant's recommendations level of involvement in monitoring the project

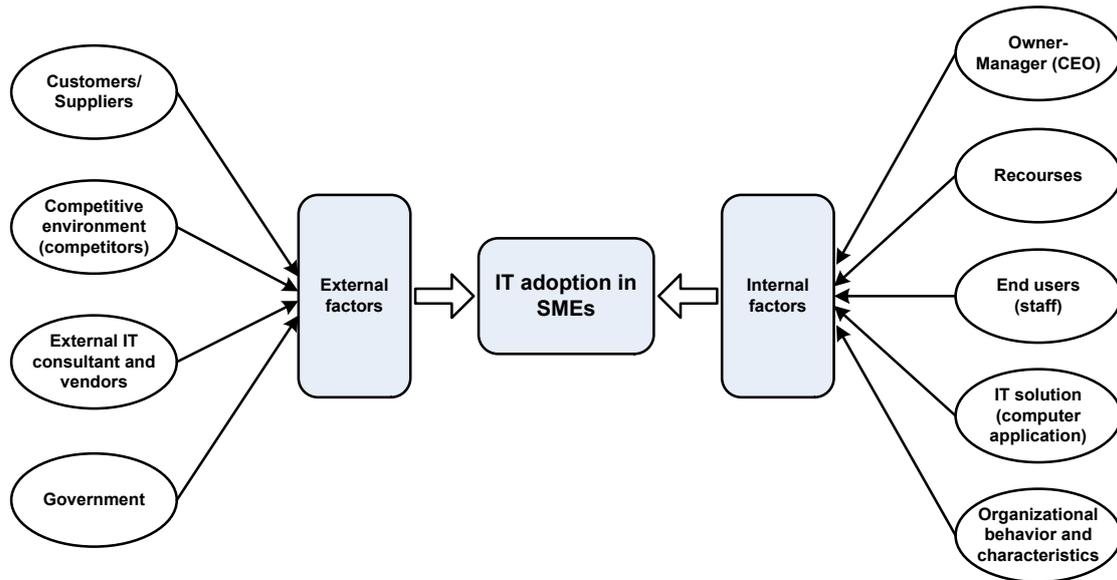


Figure1. Proposed framework of IT adoption in SMEs