Interrelated Factors Influencing the Adoption Decision of AIS Applications by SMEs in Jordan

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Abstract

This study aims to identify the main factors that either facilitating (motivating) or inhabiting the adoption decision of AIS by small –medium sized companies in Jordan. In order to accomplish the research objectives, a conceptual framework was designed. The conceptual framework includes three major interrelated factors: organizational, technological and environmental factors. The data for this research were collected through email survey with 101 respondents. The target respondents were the small-medium sized companies in Jordan and the key respondent approach was used. A group of twenty factors, employed as variables from the previous studies and models of adoption were listed and examined in a neutral manner, without pre-classifying them as barriers or incentives, through email surveys sent to key respondent in the SMEs. Respondents were asked to indicate how these factors influence their AIS adoption decisions. Furthermore, a comparison analysis has conducted to show how these factors are perceived differently among those who have adopted as AIS, those that will not adopt it all and those that might adopt it in the near future. The finding showed that only twelve of these factors were found significant, eight labeled as incentives and four labeled as barriers. However, the set cost factor was the only shared one perceived as a barrier among all groups. The results showed the three groups adopt perceive factors differently. The research has finalized with some theoretical and practical implications and recommendations.

Keywords: AIS (Accounting Information System), adoption, SME (Small-Medium Sized) Enterprises, Jordan

1. Introduction

1.1 Research Background

The main function of accounting is to provide the users with reliable quantitative information. The AIS is an information system that is developed to make the performance of accounting functions more effective. Accounting Information Systems (AIS) are a tool which, when integrated into the field of Information and Technology systems (IT), were developed to help in the management and control of issues related to firms' financial activities. But the high progress and spread in technology has opened up the possibility of producing and practicing accounting information from a management strategic perspective. Due to its importance for all firms, the adoption of AIS could be highly important for medium-sized and small, particularly those which work under the conditions of uncertainty in the competitive market.

Small and Medium Enterprises (SMEs) play a significant role in all business over the world and are viewed as the key initiative of innovation and growth. Their role to the economy is well recognized worldwide (Grande et al., 2011, Awosejo et al., 2014). SMEs are responsible for the employment creation and economic growth. In Jordan, they account for over 80% of all companies (Jordan National Statistical Year Book, 2014). Previous studies (Ismail and King, 2007; Guo and Feng, 2008; Awosejoet al., 2014) showed that large companies were highly likely to adopt AIS than SMEs. This might be due to the high cost associated with the adoption of AIS. In fact, accounting information system is beneficial and valuable to the all types of business regardless their size, it can provide help during all the process of decision making and enhance business performance and strategies (e.g., Romney and Steinbart, 2014). Consequently, many organizations should adopt and practice AIS in order to

manage, execute and control adequately in all areas and functions. Furthermore, the development of AIS enhanced the role played by accounting departments and contributed to the professional added-value of their organizations. Human error factor within automated AIS developed by software experts occurs much less if compared to non-automated systems (Ilhan and Veyis, 2009). Organization's management can better plan and control operations related to business through the AIS.

Nowadays, organizations are more concern to use accounting information systems in order to enhance business performance and to achieve competitive advantages, booming international economy, and improving business conditions. Therefore, there is a growing interest among researchers to gain more insight about the problems and solutions of the practice of AIS by SME. AIS in Jordan is in its initial stages of adoption. There are changes taking place in the IT landscape of Jordan. This study has come to find out where Jordan stands in terms of IT adoption especially in the AIS field and at what level AIS among SME is being implemented.

Over the past twenty years, there have been tremendous studies concentrating on the adoption decision of IT technology in general, and IS in particular. However, there is no clear empirical evidence about the factors that influence the adoption decision of IS by SME in developing countries, like Jordan. In previous studies on IT adoption, these factors are identified most frequently as either motives (they are known in previous studies as facilitators, drivers, determinants, incentives) or barriers (inhibitors) to adoption and use (Doms et al., 2004; Wongsim, 2013; Al-Dmour et al., 2015; Maqableh et al., 2015). Previous research on the adoption of IS has been inconclusive regarding the applicability of a western-developed model of technology adoption in other cultures (Masa'deh et al., 2015, Tarhini et al., 2015a). Therefore, this study has come to examine the applicability of such models in Jordan as non-western country. A research on factors hindering AIS adoption in SMEs in Jordan is still limited or not done at all at the time of this study.

This study mainly focuses on those factors motivating / inhibiting the adoption of AIS by small-medium business companies in Jordan. The importance of such study is based on many reasons; notably, its capability of providing some insights into the adoption of AIS by Jordanian small-medium business companies, which should help accounting professional users to gain more insight into the current situation, benefits, and barriers to the practice of AIS applications. Furthermore, based on the general insights offered, accounting persons should be well-informed in advance about the rate of AIS applications in Jordan to decide which type of change and actions the companies should take into considerations in order to adopt the AIS more effectively. Furthermore, a review of literature showed that research on AIS is heavily directed to business companies in developed countries such as UK and USA. The study, therefore, have focused on the factors influencing the AIS adoption in SMEs in a modest attempt to bridge this gap.

1.2 Accounting Information System: Definition and Importance

While accounting is a business function aims to provide specific users with quantitative accounting information, the AIS is an information system that is designed and implemented within an organization to enable the accomplishment of accounting functions (Ghasemi et al. 2011). There are various definitions of AIS. This system is simply defined as 'a unified structure within an entity, such as a business firm, that employs physical resources and other components to transform economic data into accounting information, with the objective of satisfying the information needs to a variety of users' (Hansen et al. 2009). An AIS consists of four major sub-systems: (1) The transaction processing system, (2) The general ledger/financial reporting system, (3) The fixed asset system and (4) The management reporting system, which provides internal

The AIS is a subsystem of organizational management information systems (MIS). The purpose of the AIS is to measure business financial performance and perform organizational accounting functions. Accounting information is required not only by management in managing the financial activities of the companies but also by shareholders, who need regular financial statement in order to evaluate business performance. It is required by a government to ensure the effective utilization the country's resources therefore; it plays a significant role in all economic and social aspects. It assists in auditing and examining irregularities and misappropriations. Accounting information is the cornerstone of any organization without which it is likely to stay inactive or unworkable (Rom and Rohde, 2007).

1.3 Research Problem and Questions

This research has come to examine the main factors influencing the adoption of AIS by SMEs in Jordan as a developing country. According to the knowledge of the researchers, this study could be the first study tackling such problem in Jordan. The study problem will mainly try to answer the following questions:

1. To which extent the AIS applications are practiced or used by accounting departments SMEs in Jordan?

2. What factors facilitate or inhibit the adoption of AIS applications by Jordanian small-medium business companies?

1.4 Research Objectives

The main purpose of this study is to determine the main factors inhibiting or facilitating the adoption decision of AIS applications by small-medium sized companies in Jordan. The specific aims of this research were as follows:

1. To find out to which extent Jordanian small-medium sized companies practiced/used the AIS applications. This is to examine the content and context of AIS in Jordan.

2. To evaluate which of the derived factors is most influential in determining the resultant extent of the use of AIS applications (adopters vs. non-adopters).

2. Literature Review

2.1 Accounting Information System: Definition and Importance

While accounting is a business function aims to provide specific users with quantitative accounting information, the AIS is an information system that is adopted and implemented within an organization to enable the accomplishment of accounting functions (Borthick and Clark, 1990; Ghasemi et al. 2011). There are various definitions of AIS. It can be viewed as an established structure system within a business firm, which uses financial resources and other resources to transform economic data into accounting information, for the purpose of satisfying the information needs to a variety of users. AIS consists of four major sub-systems: (1) The transaction processing system, (2) The general ledger/financial reporting system, (3) The fixed asset system and (4) The management reporting system, which provides internal (Ghasemi et al. 2011).

The AIS is a subsystem of organizational Management Information Systems (MIS). The purpose of the AIS is to measure business financial performance and perform organizational accounting functions. Accounting information system can be simply defined as a computer based system usually used for classifying, collecting, and analyzing a company's financial and accounting data. Accounting information systems are generally employed by managers to take strategically actions and decisions, and provide financial reports for stakeholders: shareholders, investors, employees, and government (Rom and Rohde, 2007). Accounting information is required not only by management in managing the financial activities of the companies but also by shareholders, who need regular financial statement in order to evaluate business performance. It is required by government to ensure the effective utilization the country's resources therefore; it plays a significant role in all economic and social aspects. It assists in auditing and examining irregularities and misappropriations. Accounting information is the cornerstone of any organization without which it is likely to stay inactive or unworkable (Ghasemi et al. 2011). Going electronic is increasingly becoming a popular trend in different areas of work. This actually becomes more needed when it comes to having to deal with countless volume of numbers and statistics. Accounting is a great example in this respect. Companies have been always looking for solutions to make their accounting work more efficient, cost-effective and less time consuming and the solution certainly lies in AIS, which gives clients all of that.

2.2 Empirical Research

Several studies have examined the adoption of IS system and innovations for several reasons in the past. In this study, the review is focused on and is limited to the adoption and use of AIS by SMEs. However, few studies have attempted to understand why accounting information systems are adopted (Wongsim, 2013).More specifically, research of the factors influencing AIS related factors, such as adoption and usage, is far more limited than research of other trends involving the AIS. Although the AIS is increasingly being used worldwide, little theory-driven research examined the antecedents of AIS adoption and use is available (e.g., Wongsim, 2013). Furthermore, these studies do not provide a comprehensive understanding of the factors influencing the adoption of the AIS. They focus only on one or two aspects-the characteristics of the AIS and the social aspect-and the analyses were at the organizational level.

Guo and Feng (2008) believed that the existence of accounting comes primarily to satisfy a need for information. Accounting data must respond quickly to users' needs in order to be relevant. The main task of financial reports is to provide accurate and timely information about the financial position and status of the company, its operational business progress and monitoring any changes in the company's financial situation and cash flow (Romney and Steinbart, 2014). Linda (2007) elaborates that record keeping has two main tasks, namely to advice owners business transactions and a complete and easy process to record the business transaction through widely available and verifiable income tax information. For an accounting system to be good, it should provide accurate,

timely, and full results of information in order to facilitate the comparison between present and past year's data, as well as enable the use of financial statements by stakeholders such as government, bankers, creditors, investors and disclosing any relevant information (Obeidat et al., 2013; Tarhini et al., 2015b).

On the other hand, some researchers argued that many small-medium sized companies simply do not maintain adequate financial records and/ or that they do not take advantage of the practice of their financial reports well. Davis et al. (2009), for example, emphasized on the fact that small or big businesses should have similar accounts record such as the income profit/loss statement, budget, capital, assets and liabilities. A small company needs to go through and understand its expenses, income, assets and liabilities. Several software applications introduced such as interface, wizards file, icon and pre built templates for multitasks can recall and repeated transactions by keeping records that are used on regular basis. By practicing this form and techniques, record keeping will be accurate and accessible (Davis et al. 2009).

Information technology, which was limited only to large companies in the previous decades, can now be used by SMEs to enhance their business performance and competitive advantage (Ghasemi et al. 2011). Competitive advantage can be gained by meeting and processing customer orders and requirements effectively and, then, achieving their satisfaction. On competitive side, AIS permits more opportunities for business since it enhances effectiveness and efficiency based upon precise decision-making. Moreover, AIS can be operated to include a wide a range of activities and process of the one organization that aim to save costs and have access to evidenced solutions. Also, organizations are benefited by being enabled to upgrade the level of procedures and have more congruent with relevant best practices (Pollock and Cornford 2004). Inclusions of business applications within AISs facilitate the implementation of common business functions like human resources management, and stock management. Taking into consideration that computerized business processes are embedded into comprehensive, AIS that can also produce real-time data (Ghasemi et al. 2011). Accounting information systems can improve control and strategic decision-making through real-time information produced for management. Booth, et al. (2000) argued that accurate and timely information appears necessary in light of the fact that AISs provide very easy access to the database since it always available to users. In support of this, AIS has more effect on transaction processing if compared to reporting and decision support. Furthermore, a guarantee decision will be improved by well-organized and classified information gained from AISs, accompanied with the experience of professional accountant (Booth et al., 2000).

Booth et al. (2000) also claimed that AISs has several advantages, such as enhancing business processing efficiency, better quality financial report, greater flexibility in information generation, eliminating duplications efforts, upgrading integration of financial reports and forms, reduced paperwork and cost, and rationalized decision process by obtaining an accurate accounting information. As a result, the business performance of the organization is improved. However, AISs advantages are only valuable if they are not exceeds by the costs of implementation. Hence, SMEs will not realize the benefits of using such a system where the costs are higher. Sajady et al. (2008) also elaborated that the practice of AIS could be more beneficial and effective in decision-making process when the benefits outweighed the costs. They concluded that the advantages of AISs can be assessed by their influence on the enhancement of decision-making process, performance appraisal, quality of financial reports, internal auditing and improving business competitiveness. However, there is a need for full capacity utilization of AISs in order for SMEs to take advantage of practicing AISs. This can be accomplished by probably using highly qualified employees. In line with this, Flynn (2003) claimed that AISs adopted should be effective in order that these benefits can accrue. Hence, evaluation models are used to evaluate the effectiveness of AISs according to the purpose of usage. He also argued that AISs adopted need to be effective in order for these benefits to accrue.

Wang and Cheung (2004) concluded that many SMEs do not have both adequate financial capabilities and resources or are not willing to invest of their money and efforts because of the long process and high installation costs associated with AISs adoption. In addition, results of previous studies indicated that the adoption and implementation of IT largely depends on CEO support as an important factor. The adoption and implementation of new innovations comes along a supportive climate and the provision of adequate resources. Davis (1989) pointed out the perceived benefits and perceived usefulness is the two main factors facilitating the adoption decision of AIS by SME. Sound perception of privileges of electronic tools is considered as the main drive behind adopting accounting information technologies. Consequently, if accounting information technologies are prioritized highly by chief financial officers based on electronic means' compatibility, superiority and easiness of comprehension, it means that such means have more opportunities to be adopted. Furthermore, Ismail and King (2007) concluded that the perceived usefulness of using the practice review system was a significant factor influencing auditors' attitude towards the acceptance of the information system. However, the ease of use factor was found not to be significant (Ismail and King, 2007).

The implementation of AISs by SMEs is also influenced by the complexity of AISs. SMEs owners are not willing to adopt the technology when AISs are perceived to be too complicated and beyond their needs (Sajady et al, 2008). Strength of managerial and strategic competencies are needed sometimes within the process of adopting and implementing AISs to realize the valuable correlation between the business structure and the system itself, and to manage duly with the output of AIS implementation that is represented in unavoidable organizational impact (Gibson et al., 2000; Poston and Grabski, 2001).They also found that the lack of financial resource and inadequate skilled personnel are the main problems for Canadian small businesses not to adopt IT. A review literature in technology innovation has revealed that availability financial and human resources as well as adequate IT infrastructure in large organizations and management commitment can encourage the adoption of innovation (Gibson et al., 2000). In comparison, inadequate financial resources, unavailability of IT expertise were among the barriers that small and medium businesses might have to encounter in order to adopt information system. Gibson et al. (2000) also reported that a lack of capital as well as the lack of top management commitment was viewed as the main barriers inhibiting the adoption of information system and technology by small companies. Furthermore, Gwangwava et al. (2012) indicated that perceived cost, complexity of AISs, lack of government support, inadequate financial resources were strongly influence the decision of adoption of AISs by SMEs while lack of knowledge about AISs as well as reluctance were not.

The above studies have provided important theoretical and empirical contributions to the research on the adoption of accounting information system. External environmental factors such as governmental rules and regulations, market competitive pressure, readiness of suppliers/vendors for IT business and availability of the right partners with whom to work were also mentioned by previous studies as either hinders or incentives to the adoption of IT system by small-medium sized companies (e.g., Guo and Feng, 2008).

3. The Study's Conceptual Framework

The first step in this research is a thorough review of the literature and development of an extensive list of variables suggested as significant barriers or incentives to the adoption and use of IT. This review focuses on, but is not limited to, the adoption and use of AIS by SMEs. Studies related to adoption and use of information and IS, in general, are also considered. In previous studies on IT adoption, a lot of factors are identified most frequently as either motives (also referred to in the literature as drivers, determinants, incentives) or barriers (inhibitors) to adoption and use. Researchers have clustered these factors in different ways. In this study, such factors are grouped into environmental, technological and organizational characteristics, based on technology, organization, and environment (TOE). This framework is developed by Tornatzky and Fleischer (1990). In the context of IT adoption, the same framework has been also used in previous studies (e.g. Zhu et al. 2003). Because these studies reflect theoretically and empirically the factors that influence IT and AISs, they constitute a solid ground for this study.

Tornatzky and Fleisher (1990) argued that the process of adoption of technological innovation by individual is determined by three interrelated categories of factors. They are organizational, technological, and environmental characteristics. The organizational characteristics include organizational competence and resources, organizational structure, top management support and other variables. The technological characteristics include both the availability of IT infrastructure as well as the processes. The environmental characteristics include the suppliers support, competition pressure, change agents, and the government policies. These three categories present "both threats and opportunities for technological innovation" (Tornatzky and Fleisher, 1990, p. 154). Therefore, they might influence the way a company sees the need for, searches for, and adopts new technology. Figure 1. below explains these three categories.
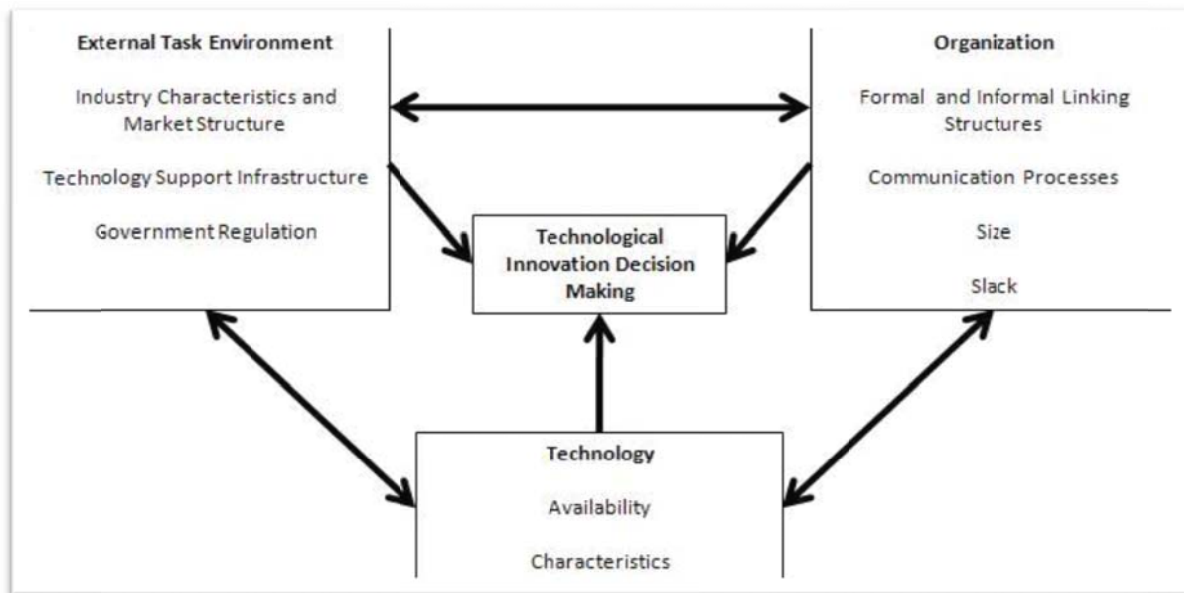
Figure 1. Technology-Organization-Environment Model

Source: Tornatzky and Fleisher (1990, p. 154).

The conceptual framework of this study has been designed to illustrate factors influencing AIS decision adoption. The developed framework investigates and analyzes the relevant factors through looking at the context form of the problem. These factors are:

1. Organizational Factors: The first category includes the organizational factors that relate directly to the availability and use of internal resources. Organizational factors identified in the previous studies relate mainly to business size, top management commitment and support, organizational structure and culture, employee's level of IT knowledge, industry sector, business location, and information-intensity (e.g., Zhu et al., 2003).The financial resources of any business company limit its ability to acquire and invest in a new technology. Compared to smaller firms, larger firms are highly likely to spend a much more of financial resources, time, and commitment to use the technologies. Complexity of the business tends to affect the adoption of AISs by both small and large organizations. Due to the complex nature of their business and voluminous transactions, large organizations have a high probability of adopting AISs compared with small firms whose transactions are not that complex. Agreeing with that, Markus and Tanis (2000) argue that the adoption of AISs by SMEs is largely limited by their simple size in nature which is easy to manage. In comparison, Buonanno et al, (2005) suggested that business complexity, being a composed factor, is a not strong predicator of AISs adoption, whereas just company size considered being a very strong one. Moreover, as Guo and Feng (2008) indicated, size influences willingness towards adopting technologies of information technologies. They also referred to the fact that AISs' non-adoption within SMEs is not affected mainly by financial constraints. However, it is more correlated with structural and organizational reasons. This contradicts partially with what has been noticed among huge institutions, since the direct reason for AISs' non-adoption is organizational.

Wang and Cheung (2004) argued that many SMEs either do not have adequate resources or are not willing to invest a large amount of their financial resources due to the long processing, times and high cost associated with set up and use of AISs applications. In addition, results of previous studies showed that the adoption and implementation of IT largely depends on CEO support as an important factor. The adoption and implementation of innovations comes along a supportive climate and the provision of adequate resources. The current study considers the following organizational factors: top management commitment, availability of human IT resource (Technical Expertise), financial capabilities, management support, organizational culture, organization structure, and manager accounting prior experience and knowledge.

2. Technological Factors (AIS Characteristics): a number of technology-related factors are identified by the research literature as potentially affecting AIS adoption decisions. Technological factors include technology availability, cost, security, reliability and capabilities. Based on perceived ease of use and perceived usefulness, human behavior plays a paramount role in influencing the adoption of AISs. Users that perceive AISs to be useful and easy to use are more likely to adopt the technology than those that do not. In support of this, Davis (1989) suggested that the two most important factors in explaining accounting information technology adoption

are perceived ease of use and perceived usefulness. Sound perception of privileges of electronic tools is considered as the main drive behind adopting accounting information technologies. Consequently, if accounting information technologies are prioritized highly by chief financial officers based on electronic means' compatibility, superiority and easiness of comprehension, it means that such means have more opportunities to be adopted.

According to Gibson et al. (2000), the adoption of AISs by SMEs is also affected by the complexity of AISs. SMEs owners are less likely to adopt the technology when AISs are perceived to be too complicated and beyond their needs. Strength of managerial and strategic competencies are needed sometimes within the process of adopting and implementing AISs to realize the best correlation between the business peculiarities and the system itself, and to manage duly with the output of AIS implementation that is represented in unavoidable organizational impact. Also, strengths of managerial and strategic competencies are considered as a deficiency in SMEs and cause failure of AISs adoption. In support of Gibson et al. (2000), a research conducted by Duxbury (2002) found that the main inhibiting factors to the implementation of computer technologies among Canadian small businesses were inadequate financial resources and unqualified employees. The past literature in technology innovation has found that more resources and infrastructure in large businesses can facilitate the adoption of innovation (Dewar and Dutton, 1986). In comparison, limited financial resources, lack of expertise in in-house information system were among the barriers that small and medium businesses had to face to adopt information system (Gibson et al., 2000). Albert and Kinman (1990) mentioned that the larger the business, the higher the ability to hire people with specific skills, such as knowledge of information systems. Factors of technology for this study are: (1) cost to setup and maintain AIS (2) Availability and adequacy of existing of IT infrastructure to support AIS (3) Reliability of AIS and (4) Security issues of AIS.

3. External Factors (Characteristics) are related to variable-based operating systems of organizations; mainly, markets, competitive pressure, government rules and regulations, suppliers, vendors, and partners. Wholesalers, trade associations, franchisors, for instance, are all affected and led by competition, and voluntary groups in small businesses are also influenced by IT adoption, according to Treadgold (1990). As Wenzler (1996) has stated, its' more customers related matter than competitor's which leads to adopt IT in their businesses. According to Wang, et al. (2008), competition in general is considered a probable source for increasing innovation adoption since it enhances both the rate and the need of adoption of innovations. However, Porter and Millar (1985) suggested that businesses can adopt IT by changing competition rules and industry structure. IT can create competitive advantage by reducing costs or increasing differentiation. Because of the peer pressure correlated with the "diffusion effect," IT new businesses tend to adopt an innovation, where "diffusion effect", as Rogers (2003) indicated, is the degree of influence on individual or organization to approve or reject the innovation. This is led by motivation of the peer network in social system, according to Rogers (2003), rather than as a result of a cost/benefit assessment, firms may end up adopting because of perceived competitive necessity (or even sheer imitation).External environmental factors are classified throughout this study as the following: (1) Competitive pressure from other internet adopters within the industry (2) Government rules and regulations (3) Availability of the right partners with whom to work and (4) Readiness of suppliers for electronic business.

4. Research Hypotheses

Based on the above proposed research framework, the following hypotheses were formulated:

H1: All the identified potential factors (organizational factors, technological factors and environmental factors) influence the adoption decision of AIS by small-medium sized companies in Jordan.

H2: There is no statistically significant difference among the respondent's groups (adopters, intend to adopt, and non-adopters) in terms of their perception of these factors as incentives or barriers.

5. Research Methodology

This section presents the rational reasons for selection of quantitative approach as an appropriate method to collect the required data to examine the research questions. Generally, a research methodology illustrates the decision concerning the choice of data collection method, and also more decision about scaling procedures and measurement, samples frame and size, and data statistical techniques. Quantitative and qualitative are the two popular research approaches that can, either one or both, be used to achieve the research objectives. These approaches are frequently mentioned and used in humanities studies including Information Systems. Quantitative research approach searches for causes and facts from the respondent's opinion or perceptions. It manipulates, interprets, and describes the data. It also tests the hypothesis in numerical way (Creswell, 2013). Furthermore,

qualitative research approach manipulates and interprets the observation in non-numerical for the aim of exploring the meanings and types of relationships (Saunders et al., 2012).

According to Hair et al. (2010), quantitative research is useful for the purpose of describing the variables and their relationships, in addition to testing hypotheses. It is also helpful in providing detailed planning prior to data collection and analysis, and to providing tools for measuring themes, planning design stages and handling the population or sampling problems. Furthermore, this approach employs statistical measures and control procedures that can minimize the bias level and confound variables. Quantitative approach is the most useful technique in dealing with many issues and problems of internal validity, external validity and reliability of measures and procedures. Literature indicates that there are several barriers and motives (i.e. factors) that influence the adoption decision of AIS. Based upon the theories of adoption of innovation as well as the existing literature of adoption of AIS, this study adopts the quantitative approach to answer the research questions.

5.1 Selection of the Data Collection Methods

Two data collection methods are used to support this study. As for secondary data, it was obtained from various books, periodicals, theses, and the internet. The empirical part of the study discussed the factors influencing the adoption of AIS by the small –medium business companies in Jordan. To study the general picture of the factors that influence the adoption of AIS by accounting department, a questionnaire is used in a way that helps to probe further into manager's opinion and views. Statistically, it is believed that questionnaires containing a large sample size are designed for unbiased statistical results, which apply on the whole population (Saunders et al., 2012). The designed questionnaire for this study is reviewed by five accounting practitioners, academicians, and accounting consultants. Based upon their comments and notes, the questionnaire was modified and then distributed.

Data collection was performed through a self-administered, web-based questionnaire, which was sent to the targets by e-mails. According to Sekaran and Bougie (2010), there are many benefits with this method of data collection. Respondents can have the freedom to fill out the questionnaire when they have the time to do so. The data collection process can be performed over a short time-span and respondents perceive this method as the most anonymous. On the other hand, there are some drawbacks with a self-administered questionnaire. Respondents who are unfamiliar with responding surveys on the internet may not be willing to participate. Another problem is that managers are usually flooded with e-mails and may decide to ignore the invitation. It may even happen that the invitation gets stuck in a spam-filter and never arrives to the appropriate respondent. It is also problematic that one cannot be sure that the respondent actually understands the questions in the survey and responds correctly.

5.2 Research Population and Sampling Design

Following Saunders, et al. (2012), the researchers should identify several requirements when designing the sample. They include 1) the sampling frame, 2) the selected ample process, and 3) the size of the sample. In the present study, the sample was collected from Amman Chamber Industry database. The target population for this study is all small-medium sized companies located in Amman, Jordan. The random sample covers only 10% of the total number of these companies, which is (1450), and with a number of employees less than 100 employees (Jordan National Statistical Year Book, 2013. This sample was selected because SMEs businesses employ large number of people and greatly contribute to the national income in Jordan. The most commonly used international criteria for defining a small and medium business in many previous studies is the number of full–time employees. This study only classifies SMEs as companies with less than 100 full- time employees based on Jordanian companies law. The questionnaires were emailed to the managers of the selected companies. Managers were selected as the key respondents of this study because they were highly expected to be familiar with the AIS applications as well as they were the most key decisions who can decided on the adoption of AIS by their firms. The required data was gathered during the summer time in 2015.

5.3 Selection Scale of Measurement

The variables are deduced from the literature and it is recognized that some of them might act in conjunction with one another, or that their full effect could only be observed in the presence of others. Measurement is defined as "the rules for assigning of numbers to objects in such a way as to represent quantities of attribute" (Hair, et al., 2010). The details items and scales consist of the following:

1) General information: this section of the questionnaire includes general questions about the selected companies' demographic characteristics such as the number of employees, and business experiences, type of business, accounting structure department and so on.

2) The dependent variables (the extent of the adoption of AIS): The participants are asked to indicate the extent to which their companies adopt the AIS. Respondents are asked to choose one of the following answers: (1) will not adopted at all (2) intend to adopt and (3) adopt.

3) The independent variables: This section of the questionnaire includes all the independent variables (factors) in this study. Responses are collected through a seven point Likert scale where the lowest value of -3 indicates a 'major barrier' the midpoint 0 indicates 'no effect or influence' and the highest value of a +3 indicates a 'major incentive'. Thus, each factor could be rated as a barrier, an incentive or 'no effect' on the decision to adopt and use AIS. These factors are listed in Table 1 below.

Table 1. Definitions of Variables and their Sources

Variable Name	Definition	References (examples)
	(1) **Organizational variables**	
Q1	Financial capabilities	Xu et al., (2002);Wongsim, (2013);Awosejo, et al., (2014)
Q2	Human IT resource	Sirisom,et al., (2008)
Q3	Organization structure: size	Xu et al., (2002);Wongsim (2013)
Q4	Organizational culture: willingness to adopt new technology	Naomi and Kevin (2007)
Q5	Top management support & commitments	Xu et al., (2002); Ussahawanitchakit and Phonnikornkij (2006); Omar et al. (2009)
Q6	CEO IT Knowledge	Naomi and Kevin (2007); Wongsim(2013)
Q7	CEO innovativeness	Naomi and Kevin (2007); Wongsim(2013)
	(2) **Technological variables**	
T1	Perceived AIS usefulness/value	Xu et al., (2002); Ussahawanitchakit and Phonnikornkij (2006); Omar, et al. (2009); Wongsim(2013)
T2	Perceived ease of use of AIS/flexibility	Xu et al., (2002); Ussahawanitchakit and Phonnikornkij (2006); Omar et al. (2009)
T3	Perceived complexity of AIS	Xu et al., (2002); Ussahawanitchakit and Phonnikornkij (2006); Omar et al. (2009); Wongsim (2013)
T4	Perceived cost of setup and maintain of AIS	Naomi and Kevin (2007); Wongsim(2013)
T5	Perceived reliability of AIS	Xu et al., (2002); Ussahawanitchakit and Phonnikornkij (2006); Omar, et al. (2009); Wongsim (2013)
T6	Security issues (Security)	Naomi and Kevin (2007)
T7	Adequacy of existing technology (Technology Availability).	Xu et al., (2002);Wongsim(2013)
T8	Accounting standard	Sirisom, et al., (2008)
T9	Nature of AIS	Xu et al., (2002); Wongsim(2013)
	(3) **External environmental variables**	
E1	Readiness of suppliers for electronic business	Naomi and Kevin (2007); Wongsim(2013);Awosejo et al., (2014)
E2	Availability of the appropriate partner	Sirisomet al., (2008)
E3	Accounting Firms /Competitive Pressure	Omar, et al. (2009)
E4	Government rules and regulations	Davila and Foster (2004); Ussahawanitchakit and Phonnikornkij (2006)

6. Data Analysis Techniques

In this study, different descriptive and inferential statistical methods have been used to analyze the data: (1) Cronbach Alpha to test reliability and consistency between variables (2) Percentages, standard deviation to study the characteristics of the respondents profile and factors and (3) T-test and ANOVA analysis.

6.1 Validity and Reliability

The questionnaires is assessed and evaluated prior to distribution to respondents by a number of key specialists and professionals in this business research field. However, the reliability of the study is assessed by examining the Cronbach's Alpha coefficient. The value of Cronbach's alpha is found to be 0.81. It shows the stability and consistency of the scale are acceptable. The reliability of a study tool is the degree to which the measures are free from error and therefore yield consistent results (Hair, et al., 2010). The consistency of the tool is followed when designing the questionnaire. This reflects on its results, as they are consistent. It also measures the stability of the tool. Table 2 below, shows the values of the Cronbach's Alpha for all the factors included in the study.

Table 2. Cronbach Alpha Results

The Research Domains	# of items	Cronbach Alpha
Organizational factors	7	0.854
Technological factors	9	0.792
Environmental factors	4	0.830
Totals	20	0.810

6.2 Data Analysis & Hypotheses Testing

This section presents and discusses the descriptive analysis for the collected data and hypotheses testing results.

6.2.1 Research Descriptive Analysis

This part presents results and analysis of data from two areas of the survey instrument: respondent demographics, describing the survey respondents and their businesses; and respondents' evaluation of factors that influenced their decisions, as either incentives or barriers, to adopting AIS. Some details on respondents' use of AIS are included and greater detail is included on the adoption of AIS. In particular, the current state of adoption of AIS by each business studied is used to divide the businesses into subpopulations for further analysis of perceived incentives and barriers.

6.2.2 Descriptive Analysis of the Study's Respondents

Table 3. Number of Actual and Respondent Companies by Sector

Actual Number of Companies	Size of sample (10%)	Respondent Number of Companies	Rate of Respondent 0f size of sample
1450	145	101	69.6%

From the table above 3, it can be noticed that 101 companies responded to the questionnaire. The response rate is there of 69.6 percent of the size of sample. Also Table 4 below demonstrates the descriptive analysis for the collected data about the number of employees as well as business experience for the companies participating in the study.

Table 4. Descriptive Analysis of the Study's Respondents

Characteristics	Frequency	Percentage
Size (Number of Employees)		
Less than 15 employees	11	10.0
Between 16 to 25 employees	15	14.8
Between 26 to 40 employees	25	24.7
Between 41 to 60 employees	29	28.7
Between 61 to 99 employees	21	20.7
Business Experience		
Less than 5 years	11	10.0
Between 5 to 10 years	15	14.8
Between 11 to 15 years	45	44.5
Between 16 to 20 years	19	18.8
More than 21 years	11	10.8

From the table above, it can be concluded that about half of responding companies (49.5%) have less than 40 employees, 29 companies (28.7%) have between41-60 employees, and 21 companies (20.7%) have between 61 to 99 employees. It can be also observed that the majority of companies (71) have than 15 years of experience, 19 companies (18.8%) have experience between 16to 20 years; whereas 11 companies (10.8%) have more than 20 years of experience. It also illustrates that 46.1% of respondents have already adopted AIS whereas 32% and 31% are intend to adopt and not –adopted receptively.

6.2.3 Descriptive Analysis of the Factors

Means and Standard Deviations are also used to describe the respondent's perception of the independent factors. The four following tables 5, 6, 7 and 8 represent the descriptive statistics for the results from the Likert scale measurement of perceived influence of factors as either barriers or incentives to adoption of AIS. The first table

(5) shows the results for all Respondents (i.e., the study's sample). The next three tables: Tables 6, 7 and 8 show data for the three different groups: AIS Adopters, those who intend to Adopt, and those who are Not Adopt AIS, respectively. The results shown are for the target for data values measured on a 7-point scale with high point: +3 as a significant incentive, -3 as a significant barrier, and a mid- point of zero as neutral on the adoption decision. These tables also show the results of T-tests (with the null hypothesis being there is no influence on adoption and therefore a zero value), including the resulting t-value and the level of significance.

Table 5. Mean Value in Order of Descending for all Respondents

	Factors	N	Mean	Standard deviation	T-value	Significance level ≤ 5%
Q7	CEO innovativeness**	101	0.668	1.536	3.825	0.000
Q10	Perceived AIS usefulness/value**	101	0.649	1.438	3.343	0.000
Q11	Perceived ease of use of AIS/flexibility**	100	0.612	1.321	2.642	0.001
D3	Competitive Pressure **	101	0.583	1.4.21	2.611	0.002
T3	Perceived reliability of AIS**	101	0.551	1.311	2.591	0.003
Q5	Top management support & commitments**	101	0.431	1.322	2.682	0.004
E1	Government rules and regulations*	101	0.382	1.311	1.889	0.013
Q6	CEO IT Knowledge*	101	0.312	1.431	1.865	0.024
Q2	Human IT resource #	101	0.292	1.221	.990	0.140
Q3	Organizational structure#	101	0.290	1.341	.876	0.155
T5	Adequacy of existing technology (Technology Availability)#.	101	0.273	1.342	.854	0.158
Q4	Organizational culture: willingness to adopt new technology#	101	0.264	1.322	.751	0.234
T8	Accounting standard#	101	0.262	1.176	.654	0.342
T9	Nature of AIS#	101	0251	1.342	.456	0.531
T6	Readiness of suppliers for IT business#	101	-0.170	1.321	-.833	0.413
T7	Availability of the appropriate partners with whom to work#	101	-0.211	1.432	-.952	0.214
T1	Perceived complexity of AIS*	101	-0.421	1.325	-3.234	0.018
Q1	Financial capabilities**	101	-0.521	1.111	-3.111	0.006
T4	Security issues**	101	-0.642	1.322	- 3.461	0.000
T4	Perceived cost of setup and maintain of AIS***	101	-0.733	1.332	-3.943	0.000

not statistically significant for any of the groups analyze

*Statistically significant at the 0.05 level for this group of all respondents

** Statisticallysignificant at the 0.001 level for this group of all respondents

Table 6. Mean Value for Significant Factors in Order of Descending for all AIS Adopters

	Factors	N	Mean	Standard deviation	T-value	Significance level ≤ 5%
Q7	CEO innovativeness	46	0.690	1.636	3.925	0.001
Q10	Perceived AIS usefulness/value	46	0.672	1.422	2.445	0.004
D3	Competitive Pressure	45	0.656	1.532	3.643	0.002
Q11	Perceived ease of use of AIS/flexibility	46	0.672	1.4.41	2.311	0.012
T3	Perceived reliability of AIS	46	0.531	1.321	2.291	0.017
Q6	CEO IT Knowledge	46	0.521	1.302	2.182	0.021
Q5	Top management support & commitments	45	0.422	1.341	2.179	0.022
Q5	Human IT resource	45	0.402	1.321	2.160	0.023
Q3	Organizational structure	46	0.390	1.311	2.156	0.025
E1	Government rules and regulations	46	0.412	1.431	2.165	0.034
T4	Perceived cost of setup and maintain of AIS*	46	-0.632	1.232	-3.543	0.039

*Statistically significant at the 0.05 level for this group of all respondents

Table 7. Mean Value for Significant Factors in Order of Descending for Those Who Intend to Adopt AIS

	Factors	N	Mean	Standard deviation	T-value	Significance level ≤ 5%
Q7	CEO innovativeness	31	0.646	1.536	3.345	0.010
Q10	Perceived AIS usefulness/value	30	0.626	1.432	3.544	0.012
Q11	Perceived ease of use of AIS/flexibility	30	0.552	1.622	2.433	0.014
T4	Perceived cost of setup and maintain of AIS*	31	-0.754	1.425	-3.334	0.017
T2	Financial capabilities	31	-0.775	1.332	- 3.493	0.043
T3	Readiness of suppliers for IT business#	31	-0.200	1.332	-3.642	0.045

not statistically significant for any of the groups analyze

*Statistically significant at the 0.05 level for this group of all respondents

Table 8. Mean Value for Significant Factors in Order of Descending for Those Who will not Adopt AIS

	Factors	N	Mean	Standard deviation	T-value	Significance level ≤ 5%
T4	Perceived cost of setup and maintain of AIS	34	-0,813	1.325	-3.534	0.002
T1	Perceived complexity of AIS	34	-0.560	1.111	-3.211	0.006
T3	Readiness of suppliers for IT business#	33	-0.480	1.322	- 3.252	0.008
Q1	Financial capabilities	34	-0.790	1.332	-3.143	0.001

not statistically significant for any of the groups analyze

6.2.4 Hypotheses Testing

This section presents a statistical examination for the research hypotheses. The core mechanism of the hypotheses testing is to identify whether the actual sample mean is deviated from the mean of the hypothesized sampling distribution by which a certain value that will prove that is wrong. Regarding the decision criteria which will be used as a base to compete this deviation with, the researchers have chosen the most common decision criterion which is the significance level at less or equal than 0.05, it presents the critical probability in choosing between the null hypothesis and the alternative hypothesis. The assumption that will be based on this significance level sates that "if the probability of observed data is smaller than the level of significance then the data suggests the null hypothesis should be rejected and vice versa".

T-test was used to identify significant factors. The null hypothesis considered, based upon the use of neutral factors, was that there will be no effect for each factor on the adoption decision and therefore the factor would have a zero value. Factors were considered significant if a t-Test indicated the factor did have an effect upon adoption, with a minimum confidence level ≤ 5%. The t-test result showed that out of the twenty factors that were considered Table 5, only twelve factors were shown to be statistically significant at the 0.05 level or higher. These factors included: six incentives (CEO innovativeness, perceived AIS usefulness/value, perceived ease of use of AIS/flexibility, competitive pressure, perceived reliability of AIS, top management support & commitments, government rules and regulations, and CEO IT Knowledge) and four barriers (Financial capabilities, security issues, perceived complexity and cost of setup AIS).

To further clarification the comparison of the three subgroups (Adopters, Intend to Adopt, and non-adopters) Tables 9 and 10 provide the result showing a comparison of the relative rankings of the factors based on their mean values within each group. In these tables, the factor with the largest value of the mean in each group is ranked with a value of 1 for that group, and subsequent higher rank values indicate a decreasing absolute value of the mean. While Table 9 shows the relative rankings for all of the statistically significant factors that had a positive mean value, i.e. those named as 'incentives'. Table 10 shows the relative rankings for all of the statistically significant factors that had a negative mean value, i.e. those named as 'barriers'.

Table 9. The Relative Ranking of Significant Factors that were Perceived as Incentives by the Groups

Code	Factors (incentives)	Ranking based on mean value			
		All respondent	Adopters	Intend to adopt	Will not adopt
Q7	CEO innovativeness	1	2	1	-
Q10	Perceived AIS usefulness/value	2	3	2	-
Q11	Perceived ease of use of AIS/flexibility	3	4	3	-
D3	Competitive Pressure	4	1	-	-
T3	Perceived reliability of AIS	5	5	-	-
Q5	Top management support & commitments	6	7	-	-
E1	Government rules and regulations	7	8	-	-
Q6	CEO IT Knowledge	8	6	-	-
Q2	Human IT resource	-	9	-	-
Q3	Organizational structure	-	10	-	-

Table 10. The Relative Ranking of those Significant Factors that were Perceived as Barriers

	Factors (barriers)	Ranking based on mean value			
		All respondents	Adopters	Intend to adopt	Will not adopt
T2	Perceived cost of setup and maintain of AIS	1	1	1	1
T1	Perceived complexity of AIS	2	-	-	2
T4	Security issues	3	-	-	-
Q1	Financial capabilities	4	-	2	3
T6	Readiness of suppliers for IT business	-	-	-	4
T7	Availability of the appropriate partners#	-	-	3	-

For more clear information about the differences between the three identified groups in terms of their perception of those factors, a one-way ANOVA was performed to illustrate those factors for which there were statistically significant differences between groups. Results for the analysis of significant differences between all AIS Adopters and all AIS Non-Adopters can be shown in Table 11.

Table 11. ANOVA Analysis of Factor for Adopters and Non-Adopters

	Factors	Df	F	Between group significance≤ 5%	Adopters	Non-Adopters
Within group means and significance						
D3	Competitive Pressure	101	16.564	0.000	**0.860	-0.023
	Availability of the appropriate partners #	101	12.453	0.002	**0.346	-0.650
Q10	CEO IT Knowledge	100	10.342	0.009	0.551	*-.0.582
Q11	Perceived reliability of AIS	101	9.564	0.016	**0.651	-0.443
Q1	Financial capabilities	100	7.632	0.021	0.543	*-0. 697
Q2	Human IT resource	101	6.321	0.034	0.402	*-0.532
Q5	Top management support & commitments	101	5.436	0.029	*0.422	-0.543
T8	Accounting standard	100	5.321	0.046	0.465	-0.345

not statistically significant for any of the groups analyze

*indicates a factor significant in that group at the 0.05 level,

 ** indicates a factor significant in that group at the 0.001 level,

Results for the analysis of significant differences between the two sub-groups of AIS Non-Adopters (i.e., those who Intend to Adopt and those who non- Adopters) are shown in Table 12. It is worth to note that all factors that showed a statistically significant difference between the groups of either Adopters versus Non-Adopters, or Intend to Adopt versus Non adopters (in Tables 11 and 12 respectively) are shown as incentives in one group but as barriers in the counter group. That is, if one of these statistically different factors was perceived as an incentive by Adopters the same factor is perceived as a barrier by Non-Adopters. The same holds true between the two groups of Intend to Adopt and Will Not Adopt, with those who Intend to Adopt viewing all factors that were a significant difference between the two groups as incentives and those who are not Adopt viewing all of the exact same factors as barriers.

Table 12. ANOVA Analysis of Factors for Intend to Adopt vs. Not Adopt of AIS

Within group means and significance Factors		Df	F	Between group significance	Intend to adopt	Non-Adopters
Q10	Perceived AIS usefulness/value	64	14.421	0.000	0.865	-0.342
Q11	Perceived ease of use of AIS/flexibility	64	10.323	0.003	0.694	-0.453
Q7	CEO innovativeness	65	8.653	0.033	0.444	-0.421
T6	Readiness of suppliers for IT business	64	7.432	0.038	0.231	-0.532

DF indicates the Degrees of Freedom

*indicates a factor significant in that group at the 0.05 level,

** indicates a factor significant in that group at the 0.001 level.

7. Research Findings, Discussion, and Implications

The testing hypotheses have arrived to the following results and conclusions that can be compared with the previous general findings or observations: The Findings indicate that about 46% of small-medium sized companies have adopted the AIS applications, while 33% have intended to do so, but the remaining companies have not adopted them at all. The literature examining adoption of AIS by businesses discusses a very large number of factors that influence AIS adoption decisions either as barriers or incentives. This study reduces many of the factors found in the literature into twenty neutral factors. All factors are assumed to be neutral (as a null hypothesis) and a t-Test indicates that twelve of the twenty factors do have a noticeable effect on the adoption decision (with significant level at 0.05). In terms of the three groups of factors considered (Organizational Factors, Technological Factors, and Environmental Factors), and some factors are shown as significant within each category. For the three different adoption groups, the cost of setting up AIS is the only consistent factor that comes out as significant across all groups. The three groups consider this factor as a barrier against using AIS. Setup cost of AIS is, on average, the most important barrier for all groups. The effect of Government Rules and Regulations is also appeared as a significant incentive factor in this study for AIS Adopters. It is not clear at this time how Government Rules and Regulations have acted as an incentive. A competitive pressure is also found. It strongly influences the adoption decision of AIS. On average, it is the most important factor for adopters. It also shows the most significant difference between the groups of Adopters and Non-Adopters. It is well-known that competitive pressure is an important factor in whether companies adopt or do not adopt (e.g., Ussahawanitchakit and Phonnikornkij, 2006; Omar et al., 2009; Wongsim, 2013; Awosejo et al., 2014). Yet surprisingly, it is not significant for those who intend to adopt. This might be due to the importance of the type of competition structure in the market where the companies operate.

There are differences in how factors are perceived among groups at the various levels of adoption. Such differences can provide us with more information about the relative important factors that research needs to examine in applications of adoption models with AIS in SMEs. As might be expected, among the factors considered, adopters perceive many as incentives but only one is perceived as a barrier (set-up cost of AIS). For those who indicate that they do not adopt only three factors are considered as significant. Such factors are all perceived as barriers (Tables 6 and 7). For all respondents as a group, complexity of AIS is perceived as a significant barrier. However, the only separate group which perceives complexity of AIS as significant is those who do not adopt. For this group of non-adopters, complexity of AIS is the most important barrier. This result is consistent with previous studies (Ussahawanitchakit and Phonnikornkij, 2006; Omar et al., 2009; Wongsim, 2013; Awosejo et al., 2014).

A perceived lack of an available partner to work with is also found as a significant influence on the decision of adopting AIS. This factor is also reported by other researchers as a critical issue for small businesses (Xu, et al., 2002; Omar, et al., 2009). Such a variable shows up as a statistically significant difference between Adopters (who considers it as an incentive) and those who only intend to adopt (who considers it as a barrier). Three factors are perceived as incentives for those who indicate that they intend to adopt AIS. First, the perceived value of AIS to the business is perceived as an ease of using AIS and the CEO Innovativeness. Second, when the two Non-Adopters subgroups (Intend to Adopt and Non-Adopters) are compared it is found that the perceived AIS usefulness is a value and the perceived ease of use of AIS is flexibility. Third, the CEO innovativeness and readiness of suppliers for IT business appears as a significant difference between these two subgroups (Table 7). Interestingly, these factors do not show up in the significant differences between Adopters and Non-Adopters (Table 6). This result may be attributed to the fact that the group of all Non-Adopters includes the subgroup of those who intend to adopt and these three factors are very important to them.

8. Conclusion

To sum up, this study has found that of the twenty factors taken from a large number of variables mentioned in the literature, only twelve are statistically significant. Moreover, perceptions regarding incentives and barriers vary among adopters, those who intend to adopt and those with no intention to adopt AIS. Some of the significant factors found in this study have not received much attention in prior studies. They may need further attention and concern through government regulations and rules. The significant contribution of this research is that this is the first known study to focus on accountants' perceptions of the factors influencing the decision of the adoption of AIS in business companies in Jordan, as a context of a developing nation. For the adoption and usage of AIS by small-medium sized companies, there must be an increased awareness of the importance and usage of AIS in order to facilitate its proper adoption. Furthermore, IT suppliers should offer free education program, workshops and training for potential users/adopters of AIS since the cost associated with the setup of AIS was perceived as the most important barrier by many of these companies. In addition, SMEs should try recruiting qualified human resources with AIS knowledge as such will facilitate its adoption of AIS.

9. Study Limitations and Future Research

The major limitation of this study is that the sample of SMEs surveyed is limited to Jordan. Furthermore, the demographics reported by participants do not provide any evidence that is inconsistent with the typical characteristics of small and medium businesses. However, this limitation should be kept in mind when generalizing the results of this study. This study also points out the complexity of making assumptions about using these factors as variables in the quantitative analysis of the adoption models. Many factors show up as significant for only one or two of the three studied groups. However, of all 20 factors, only one, which is the perceived setup cost of AIS, is shown as significant across all groups. Also, as presented clearly in Table 5 and 6, many factors should be studied carefully because a single factor can be perceived as having both positive and negative influence on the adoption decisions for different groups. These findings might encourage other researchers to use these factors in future research.

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