



Title : Investigating E-Procurement Barriers within Six  
Saudi Arabian SMEs

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# **Investigating E-Procurement Barriers within Six Saudi Arabian SMEs**

Ahmed Altayyar

## **Abstract**

This study aims to investigate factors affecting the adoption of e-procurement in Saudi Arabian SMEs. The study adopted the Gunasekaran and Ngai (2009) model as a theoretical framework and foundation for the research to investigate current status and readiness, perceived benefits, perceived barriers, perceived critical success factors and perceived future organisational performance. Through an extensive literature review and detailed data analysis, the study extended the model to incorporate perceived cultural and external factors that were found to be necessary for the adoption of e-procurement in Saudi Arabian SMEs. Through case studies and AHP analysis, the proposed model elements were validated and prioritised in the Saudi Arabian context.

Three different methods were adopted for data collection. First, an exploratory study was conducted to understand the current status of e-procurement and provide an overview of the factors that affect the adoption of e-procurement using the Gunasekaran and Ngai (2009) model. Second, a detailed survey was conducted to find the relative importance of various factors related to each of the five elements of the Gunasekaran and Ngai (2009) model. Third, detailed interviews were conducted across four selected SMEs to gain an insight into the factors that affect the adoption of e-procurement.

The results of the exploratory study were helpful in identifying perceived factors that affect the adoption of e-procurement. Detailed survey analysis using AHP validated the theoretical framework and the relevance of the factors of the Gunasekaran and Ngai (2009) model. However, some of the factors were found to be more important than in the Gunasekaran and Ngai (2009) model, while others were less important.

Results of the qualitative study (interviews) found additional factors that were relevant to each of the five elements of the GN model. They further suggested that “Current e-procurement activities” was an additional factor in the “current status and readiness” element and “Increased transparency” was an additional factor in the “perceived benefits” element. Similarly, the analysis of the qualitative results found two additional factors in the “perceived barriers” element (i.e. absence of e-procurement specific laws and regulations and lack of trust in the electronic transfer of funds), three additional critical success factors (i.e. cost-benefit analysis of the solution, technical maturity of the marketplace and user-friendliness of the solution) and two additional factors in perceived future organisational performance (i.e. strategic alliance and networking and knowledge management and data warehousing).

Further, analysis of the qualitative findings revealed two additional elements (i.e. perceived external and perceived cultural factors). The study thus suggests that organisational culture, cultural inertia and business culture of the country are three important cultural factors that are perceived to affect the adoption of e-procurement, while government support, having one’s own postal addresses and delivery services, providing secure and trustworthy online payment options, low cost and high speed internet connection, suppliers’ willingness and readiness, pressure from competitors, policy and regulations are the seven important perceived external factors that affect the adoption of e-procurement in Saudi Arabian SMEs.

The results of the qualitative data analysis led to the development of an extended Gunasekaran and Ngai (2009) model to incorporate perceived culture and perceived external factors. The study has significant implications in terms of further e-procurement research for SMEs in Saudi Arabia and also its adoption in the developing world in general.

## **Dedication**

*I would like to dedicate this PhD to my late mother, who always prayed and wished for my success. I wish she was alive. She would have been extremely proud of my accomplishment. I hope she can see and feel my happiness from paradise and I always remember her in my prayers.*

## **Acknowledgements**

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## DECLARATION

I declare that this thesis is my own unaided work. It is being submitted for the degree of Doctor of Philosophy at the University of Bedfordshire.

It has not been submitted before for any degree or examination in any other University.

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Date:

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## List of Abbreviations

(AHP)	Analytical Hierarchy Process	(CM)	Centralised management
(GN)	Gunasekaran and Ngai (2009) model	(CBP)	Communication between participants
(CSR)	Current Status and Readiness	(CAI)	Clear and achievable implementation
(UIB)	Using the Internet regularly in business	(CAB)	Clear accountability for buying
(BHW)	Business has a website	(CCWS)	Close collaboration with suppliers
(QITS)	Qualified IT staff	(TMIS)	Top management involvement and support
(CEM)	Current e-commerce model	(UP)	Use of prototype
(UTP)	Use of Technology in the procurement process	(CS16)	Cost-benefit analysis of the solution
(CR6)	Current e-procurement activities	(CS17)	Technical maturity of the marketplace
(BE)	Perceived Benefits	(CS18)	User-friendliness of the solution
(BUS)	Better utilization of staff	(FQP)	Perceived Future Organizational Performance
(EI)	Efficiencies increment	(IPSP)	Improve performance in terms of streamlining processing
(HIS)	Help to improve supply chain management	(ELIS)	E-procurement leads to information sharing
(IRS)	Improved relationship with suppliers	(LOP)	Long-term organisational performance
(IEM)	Improved existing markets	(SOP)	Short term organisational performance
(ICSL)	Increased customer satisfaction	(SPCR)	Streamlining performance and cost reduction
(ICS)	Increased customer service level	(OC)	Organisational competitiveness
(IMS)	Increase market share	(IR)	Increased Revenue
(RIL)	Reduction in inventory levels	(FQ7)	Strategic alliance and networking
(RNCB)	Reduction in non-contractual buying	(FQ7)	Knowledge management and data warehousing
(ROT)	Reduction in operational tasks	(PCU)	Perceived Culture Factors
(RPT)	Reduction in processing time	(CU1)	Organisational Culture
(RTC)	Reduction in transactional cost	(CU2)	Cultural inertia
(SEI)	Support environmental issues	(CU3)	Business Environment and Culture of the Country
(B15)	Increased transparency	(PEF)	Perceived External Factors
(BR)	Perceived Barriers	(PE1)	Government Support
(LKS)	Lack of knowledge and skills	(PE2)	Own postal addresses and delivery services
(LIL)	Lack of appropriate infrastructure and legislation	(PE3)	Providing secure and trustworthy online payment options
(TMALR)	Top management attitude and lack of resources	(PE4)	Low cost and high speed internet connection
(LOT)	Lack of trust	(PE5)	Suppliers' willingness and readiness
(COI)	Lack of financial resources	(PE6)	Competitors' pressure
(LISFG)	Lack of interest or support from government	(PE7)	Policy and regulations
(FCINS)	Fear of change to a new system		
(IOT)	Immaturity of technology		
(ICS)	Cost of implementation		
(IFS)	Insufficient financial support		
(SC)	Security concerns		
(BR13)	Absence of E-procurement Specific Laws and Regulations		
(BR14)	Lack of Trust in the Electronic Transfer of Funds		
(CSFs)	Critical Success Factors		
(LFR)	Incompatibility with current ERP system		
(CS)	Comprehensive strategy		
(TS)	Technology standards		
(OPR)	Organisations process re-engineering		
(UI)	User interface		
(AINE)	Authentication and integration of the new e-procurement		
(ET)	Education and training		
(CPS)	Consent and performance of stakeholders		
(FS)	Firm size		

# Chapter one

## 1. Introduction and Background

Information technology has increased businesses' opportunities to extend their customer base and increase their revenue and competence. However, it has also given rise to challenges, particularly for SMEs, which inherently have fewer resources and face the challenges of being overrun by bigger firms (Gnyawali, 2009). However, with the adoption of innovative e-commerce tools such as e-procurement and appropriate strategies, SMEs can cope with and even neutralise these challenges to some extent. Such tools will particularly allow an SME to gain competitive edge over other SMEs in the sector (Schlemmer and Webb, 2009).

This study investigates the current state of e-procurement in Saudi Arabian SMEs in order to evaluate benefits, barriers, and critical success factors and perceived future organisational performance for the adoption of e-procurement in Saudi Arabian SMEs. A theoretical framework for the adoption of e-procurement used by Gunasekaran and Ngai (2008) in Hong Kong and also in SMEs on the southcoast of Massachusetts in the USA (2009) has been modified to incorporate perceived cultural and external factors to understand the adoption of e-procurement in Saudi Arabian SMEs.

This chapter discusses the background of e-procurement, the model proposed by Gunasekaran and Ngai (2009) and the key characteristics of SMEs in Saudi Arabia, where this research has been conducted. It is followed by an outline of the research significance, aims and objectives, the research questions and a brief summary. This chapter is followed by the literature review, which provides a detailed account of e-procurement, related terms and previous.

## **1.1 Research Background**

### **1.1.1 Adoption of E-procurement**

Information sharing, trust and communication with customers and suppliers have played a valuable role in the advancement of companies (Gunasekara et al., 2005). Such competition requires companies to adopt and use various electronic data exchange technologies such as the World Wide Web, Electronic data interchange, Enterprise resource planning, the internet and E-procurement to automate and standardise various business processes. E-procurement is as important for domestic business operation as it is for global business operation (Lee et al., 2008). E-procurement in SMEs has not gained much attention historically from vendors and researchers. More recently, the importance of e-procurement in international and domestic business operations has forced SMEs to adopt this approach (Arts, 2012).

### **1.1.2 Significance of Gunasekaran and Ngai's (2009) theoretical model**

E-procurement has the ability and potential to enable SMEs to adapt to the needs of modern-day business and is economically more productive and profitable for businesses by reducing transaction time and cost (Narayanasamy et al., 2008). Adoption of e-procurement is a challenging task for SMEs due to their small size and limited resources. Lack of awareness and its effects on organisation performance are the main reasons for SMEs' slow progress towards e-procurement adoption (Mohamed, 2010). Gunasekaran and Ngai (2008) conducted a study in Hong Kong and on the south coast of Massachusetts in the USA (2009). The model adopted shows factors that are of key importance for SMEs' owners and managers to consider while adopting e-procurement. This research will test the Gunasekaran and Ngai (2009) model.

Previous studies on technology and innovation adoption have used any different models such as TOE (Technology, Organisation and Environment), TAM (Technology acceptance Model), TPB (Theory of Planned Behaviour), DOI (Diffusion of Innovation) but the author found NG (2009) more suitable, firstly because it compliments and elaborates TOE model by mentioning detailed specific factors in the context of environment, technology and organisational and also provides an insight into benefits, importance and other critical that

can affect the adoption of e-procurement. Secondly TAM and TPB could have not been used because researchers have found them unsuited for investigation of factors that affect the adoption of technology at strategic level. Thirdly this model highlights issues that are specific to SMEs while the other models discuss general factors that affect the adoption of innovation in any organisational context. The research extends the model to include the cultural and external factors which makes it more suitable because Saudi Arabia represents a more conservative religious culture that affects all aspects of life including SMEs and other business organisations.

### **1.1.3 Why Saudi Arabian SMEs**

SMEs have a vital role in Saudi Arabia economy and its role has become more significant after the huge reduction in oils prices which the country hugely relied on. The government has taken some significant steps in recent time to promote the SMEs sector further in the form of financial funding and changes in business policy guidelines to encourage foreign investments into the country. Currently the Kingdom of Saudi Arabia account for 1.97 million SMEs which is nearly 90% of all business organisations in the country. Saudi Arabia constitutes 20% of SMEs in the MENA (Middle East and North Africa) region. The SMEs sector account for 20% of the labour force in Saudi Arabia. The cost of establishing an SME is very less as compare to other countries and thus the numbers of SMEs have grown significantly in the country. However in spite of such a huge number of SMEs, their contribution to GDP is only 33% which is significantly low as compare to the developing world and one key reason after lack of financial funding and training is the lack of technological adoption in these SMEs(e.g. E-procurement etc). Since SMEs account for 60% of employment and 90% of overall businesses, the government of Saudi Arabia have recently decided to focus on the sector, especially after the significant fall in the all prices and the resulting damage to the economy. The government has decided to find alternative ways reduce the country reliance on oil and SMEs have thus occupied a central position in their development plan.

In spite of the recent efforts of government and author trade and financial institutions in the country, SMEs are still lagging to meet the needs of national trade agenda and the number of employment to people that it should. For example the contribution of non-oil SMEs in the country to national GDP is 30% which is well below the international benchmark of 45% for other economies. The key reason has been the SMEs concentration in low productivity sectors.

Adoption of technology such as e-procurement can significantly improve the productivity of SMEs by allowing them to procure cheap products from other countries and increase their customer base beyond the country and generating huge revenue and increased contribution to Saudi Arabia's GDP.

The adoption of e-procurement in Saudi Arabian SMEs faces many challenges and barriers (Alshehri et al., 2012). One difficulty is the lack of knowledge and awareness about e-procurement and its effects on firms' performance (Abdallah and Albadri, 2010). A theoretical framework for the adoption of e-procurement used by Gunasekaran and Ngai (2008) in Hong Kong and also on SMEs on the south coast of Massachusetts in the USA (2009) will be applied to select Saudi Arabian SMEs. From the literature, it is evident that the framework highlights the benefits and importance of e-procurement issues that might arise and the critical factors for the success of e-procurement, which include communication systems, financial systems, top management support, security systems and company priorities.

## **1.2 Significance of Study and Research Contribution**

This study is significant for many reasons. Firstly because SMEs are very important for the economy of the country and e-procurement can potentially increase the profitability of these SMEs, however no study has previously been conducted on the adoption of e-procurement in Saudi Arabia. The outcome of this study is not only significant for the SMEs owners but also for the government that is focussing much on the sector. The study will be a huge addition to the existing literature and will serve a strong basis for future research in the region.

This study is based upon the original Gunasekaran and Ngai (2009) model to investigate factors that affect the adoption of e-procurement of four SME's in Saudi Arabia. It extends this model by developing further cultural, external factors and elements which are established to be relevant to the adoption of e-procurement in this context. This research is significant because there appear to be no such study in Saudi Arabia regarding the factors affecting adoption of e-procurement in SME's. This will provide a strong theoretical foundation for researchers applying the Gunasekaran and Ngai (2009) model to SME's in Saudi Arabia as this study elaborates further this research to the original study in 2009. In particular, the evaluation of cultural and external factors in e-procurement adoption is of key significance for e-procurement adoption in the Saudi Arabia. The findings of this research will be important and will also have practical implications and will be highly beneficial for SMEs wishing to adopt e-procurement and extend the efficiencies of their business.

Another key significance of the study is its use of AHP for prioritising the elements of the barriers and culture that effects the adoption of e-procurement i.e. ranking the elements of the aforementioned factors into their order of importance. It will allow the future researchers to carryout a detailed research on each of the most important elements of these factors to evaluate other relevant elements and their impact on the adoption of e-procurement. The researcher can also carry out a detailed comparison of these elements between SMEs of various types and size. Future researcher can also extend it to neighbouring countries as they are mostly same in culture and make a comparison of these elements and note the variations. The research is of key significance for the Government of Saudi Arabia, to devise ways and try and overcome the barriers this study has found so as smooth adoption of e-procuremnt can takes place. Last but not the least this research is great significance for the SMEs owners to understand the benefits of e-procurement adoption and its impact on the firm performance and also to concentrate on the internal barriers mentioned in the study and overcome it for the smooth adoption of e-procurement.



### **1.3 Aim and Objectives**

The aim of this research is to evaluate the Gunasekaran and Ngai (2009) theoretical framework for the possible adoption of e-procurement in selected Saudi Arabia SMEs and to investigate various determinants related to the Saudi Arabian context. Specific objectives of the research are as follows:

1. To explore the current status or readiness of selected Saudi Arabian SMEs for e-procurement adoption using the Gunasekaran and Ngai (2009) theoretical model.
2. To evaluate, and if appropriate, modify the Gunasekaran and Ngai (2009) model to conceptualise the benefits and barriers to adoption of e-procurement within selected SMEs in Saudi Arabia and explore additional factors that might affect the adoption of e-procurement in selected Saudi Arabian SMEs and modify the model accordingly.
3. To investigate critical success factors for the adoption of e-procurement and examine their effect on e-procurement adoption in selected Saudi Arabian SMEs using the Gunasekaran and Ngai (2009) model.
4. To examine the future perceived organisational performance in Saudi Arabian SMEs with the adoption of e-procurement using the Gunasekaran and Ngai (2009) model.
5. To provide directions and recommendations for future research.

### **1.4 Research Questions**

- Have the selected Saudi Arabian SMEs adopted the latest ICT innovations relevant to e-procurement?
- What are the critical success factors in the selected Saudi Arabian SMEs for the successful adoption of e-procurement using the Gunasekaran and Ngai (2009) model in selected Saudi Arabian SMEs?

- Is the context of Saudi Arabian SMEs suitable for e-procurement adoption and is the infrastructure adequate to overcome the barriers in the procurement process and facilitate smooth deployment of e-procurement in the selected SMEs as depicted by the factors of the Gunasekaran and Ngai (2009) model?
- What are the potential benefits for e-procurement adoption in Saudi Arabian SMEs based on the Gunasekaran and Ngai (2009) model?

### **1.5 Overview on research methodology**

In any research the selection of a specific research methodology, process, strategy and corresponding data collection tools are vital for the outcome of the research. This research used adopted the philosophy of positivism which stems from the belief that human behaviour can be studied in the same as do the natural science (Collis & Hussey, 2003).

The research strategy of this study is to use both qualitative and quantitative research methodologies to assess the validity of the research elements and the importance of each of the elements in relation to other elements.

The research process is comprised of the following key stages

- (i) To conduct an exploratory study to understand the main factors of the research and validate it from broader e-procurement literature and as a result select and to check the relevance, reliability and validity of the chosen research model.
- (ii) To conduct a detailed qualitative study (using interviews) to identify key elements in relation to each of the model factors as well as to find additional factors that affect the adoption of e-procurement in selected Saudi Arabian SMEs. A multi staged interview was used in this research to look for additional factors.
- (iii) To conduct a detailed quantitative study (using questionnaire) to find the relative importance of each element in relation to other elements of each of the model factors that affect the adoption of e-procurement in Selected Saudi Arabian SMEs. AHP was used to analyse the quantitative data and assess the consistency of the results.

## 1.6 Thesis outline

**Chapter 1: Background**

**Chapter 2: Literature Review**

**Chapter 3: Methodology**

**Chapter 4: Exploratory Study**

**Chapter 5: AHP Analysis**

**Chapter 6: Case Studies**

**Chapter 7: Discussion**

**Chapter 8: Conclusion**

## **1.7 Summary**

This chapter has presented an introduction to the background of e-procurement and the proposed framework and model for the research, and has stated the aim and specific research objectives and the research questions that are to be answered to fulfil the aims and objectives of the research. It will be followed by a literature review where a detailed account of e-procurement, its adoption in the context of SMEs, the significance of the proposed model and its relationship with previous studies will be investigated in detail.

# Chapter Two

## 2. Literature Review

### 2.1 Introduction

This chapter discusses procurement evolution followed by a detailed evaluation of the origin of e-procurement from simple procurement. The chapter further provides a detailed account of various e-procurement technologies and the models of e-procurement that are being adopted under various organisational setups. Further the chapter provides an overview of various innovation adoption models for the adoption of e-procurement. The author has then presented a detailed account of Gunasekaran and Ngai(2009) model which is the theoretical foundation of this research. In light of Gunasekaran and Ngai (2009) model, the author discusses the current status and readiness, barriers, benefits, critical success factors and future organisational performance of e-procurement adoption in selected Saudi Arabian SMEs. Since culture is extremely important and affects all aspects of technological adoption, the author has presented the cultural aspects in detail with their impact on the adoption of e-procurement in Saudi Arabian SMEs.

The research also presents various procurement and e-procurement definitions and also defines other terms and concepts related to procurement and e-procurement and describes the connection between procurement and e-procurement and the importance of e-procurement in the modern business world. Further the research presents a comparison between traditional and electronic procurement with diagram and evidence from the literature. The research also describes the problems and challenges with traditional procurement system. The research also discusses various e-procurement technologies such as inter-organisational services, EDI and e-services followed by an examination of the adoption of e-procurement in SMEs, an overview of different adoption models and an examination of the efficacy and relevance of the proposed research model, i.e. Gunasekaran and Ngai (2009), and its relevance to other ICT innovation models. Further, the research discusses various elements of the model in the light of relevant literature and studies. The research specifically examines the characteristics of SMEs in Saudi Arabia, the cultural

perspective and the current state of technology, education, laws and other issues, challenges and motivating factors that can hinder or help in the adoption of e-procurement. The chapter provides a detailed account of the progress Saudi Arabia has made in recent years in internet and mobile technology and the efforts that the government has made or intends to make in the future. It also discusses the weaknesses of the government in terms of legislation, imparting awareness, educating the masses in terms of technology and providing necessary technical and financial support to SMEs. The impact of culture on the adoption of e-procurement in dimensions is also explained in this chapter. Finally, there is a brief summary of the whole chapter. The chapter is ended with a brief and comprehensive summary.

## **2.2 Evolution of Procurement**

The 1800s were when the organisational role of procurement was recognised. Charles Babbage's 1832 book, "On the Economy of Machinery and Manufactures", is one of the first acknowledgements of procurement in organisations. In it, he wrote that there should be a dedicated professional to choose, purchase and track the materials required i.e. he emphasised the position of a dedicated Procurement Officer (Callender, 2003).

The importance of procurement became more evident during the Industrial Revolution, and Marshall Kirkman's 1887 book, "The Handling of Railway Supplies - Their Purchase and Disposition", provides a detailed account of the strategic role of procurement in the purchasing of materials in the railway industry. In 1886, the Pennsylvania Railway set up a dedicated supply department for the purpose of purchasing materials for the railway (Callender, 2003).

In the 1960s, procurement once again gained popularity. The concept of competitive bidding and contracts evolved and procurement gradually achieved a departmental status. In the 1980s, there was a huge increase in supplier competition and organisations shifted their focus to dependability, quality and availability of materials from suppliers. It was during this era that supply management became a central pillar of organisations' success (Tonkin, 2003).

Procurement has been defined by many experts and business authors. Purchasing insight defines procurement as follows

*“It is the overarching function that describes processes and activities to acquire goods or services or both. Unlike purchasing it involves the functions involved in establishing basic requirements, sourcing activities such as market research and supplier evaluation, selection and negotiation of contracts. It also includes the purchasing activities needed to order and receive goods” (purchasinginsight, 2016)*

*“The process of purchasing raw material, consumable used as input in the firm’s value chain as well as machinery and equipment used in the firm” (Van Weeli, 2005, p. 10).*

Other researchers and have stated that the term ‘procurement’ extends the process of organisational buying to the process of supplier management, incorporating product selection, supplier selection, co-ordination and building a strong and long-term relationship with the supplier (Standing, 2015). This extension of the process shows the strategic importance and recognition of the term and its cross-functional significance for businesses (Castells, 2014). Kapfere (2012) has stated that the acquisition of products and raw materials for firms is strategically very important in the modern high-paced competitive business world and mere ‘purchasing’ is not an appropriate word to describe the phenomenon. The external resources in modern businesses refer to all tangible and intangible goods and services that businesses need to establish a well-known brand and connection with their customers. It must be stated here that the evolution process did face a few challenges which are discussed in the following section.

### **2.2.1 Key challenges of traditional procurement**

It is very important to identify the issues and limitations of traditional procurement system so that SMEs can better understand the needs and requirements of e-procurement and its impact on the organisational setup (Kothari et al 2007). In order to understand procurement, the author has adopted the definition of Baily (2008), who divided procurement into three basic steps: i.e. information, negotiation and settlement. Grilo and Jardim (2011) stated that every organisation wants to achieve the best quality procurement with the least investment, minimal risks and duplication while maintaining a competitive position and image in the market. Yu and shin (2013) stated that the aforementioned goals

cannot be achieved with a traditional procurement system due to its slower nature of processing and transactions handling, and thus procurement officers frequently have to deal with handling errors in order processing, which is very time consuming and costly for the organisation. Kothari et al (2007) also highlighted some of the issues and activities in the traditional procurement system that affects organisational performance. They concluded that manual data entry, error correction on papers, solving quality-related problems and speeding up the delivery of products and services make it difficult for corporate purchasers to achieve mass procurement of products and services. Other issues discovered by their research are:

- Extended relationships and complex procedures
- Dysfunctional and bureaucratic relationships between stakeholders
- Lack of quality information
- Resistance to change
- Lack of centralised and flexible control

These issues were also confirmed by Burger and Hawkesworth (2011) in their study, which also provides quantitative details of these issues. The research took account of 650 different activities within the procurement process and also investigated 98 various types of documents used in the process. McCue and Roman (2011) also identified a number of issues with procurement systems which are of tangible nature. Most of the issues identified by their research were customer-oriented issues, such as customers being difficult to deal with, bureaucratic in nature, poor delivery service and remote in nature. They termed procurement as the Cinderella activity of an organisation. The majority of researchers have focused on quantitative activities such as time and cost, and less on qualitative issues such as customer satisfaction and delivery service because these are hard to measure and comprehend. Walker and Hampson(2008) understands that the best approach will be to use various methods, such as information technology and organisational change, to get an insight into their impact on the organisation and its stakeholders; however, the bottom line lies in measuring lead time and cost. The majority of researchers, such as Hampton et al (2012) have investigated the performance of procurement teams across various types of organisations and have concluded that procurement is a costly activity where a lot of cost is involved in buying materials and unnecessary paperwork and a lot of errors are made, and



have summarised that 50% extra profit can be made if purchasing cost is reduced by 10%. Change in the procurement process is necessary not only due to the issues with traditional procurement systems but also because organisations want to meet the challenges of greater competition in the global market. Walker and Hampson(2008) summarised this issue by stating that electronic procurement has taken the focus away from the availability and price of products to an understanding of value engineering, target costing and supplier development. This shift in thinking and practice within SMEs and the corporate sector is also highlighted by Karjalainen (2009). In order to overcome these procurement the concept of e-procurement became popular which is discussed in detail in the following section.

### **2.3 Evolution of E-procurement**

The earliest available literature related to e-procurement is in relation to the use of EDI (Electronic Data Interchange), which has been in use in some form since the 1960s, using dedicated lines to connect organisations and their suppliers (Millman, 1998). Meyer (1967) published the first paper on the topic, explaining the benefits of EDI for buyers and sellers in hospitals.

The concept of internet-based e-procurement, however, surfaced in the late 1990s, when computers became commercially viable. Governments and industries started trying to find ways to use information technology to improve their productivity, to reduce costs and to improve processes. The first ever form of electronic commerce to be used was EFT (Electronic Funds Transfer), utilised by financial institutions. EFT has provided the basis for the millions of transactions that take place every day around the globe using credit cards and other e-payment procedures (Geva, 2015).

Prior to 1997, electronic exchange of data related to the purchasing of products was limited to fixed orders or to a group of well-established companies using EDI. However, for many people, EDI is still considered to be synonymous with e-procurement. It is true that well established companies have been using e-procurement for over 25 years but they were using dedicated leased lines connected to only a limited group of suppliers, which were very

expensive and lacked standardised protocols. The process was too expensive for smaller companies (SMEs) as the cost was between US \$25,000 and US \$40, 000.

The airline industry used EDI to make connections with travel agents in order to improve its services (Alt and Klein, 2011). When personal computers became viable for messaging, electronic mails and electronic data exchange became popular for businesses. EDI allowed people to create their own bespoke systems, using the existing telecommunication infrastructure to exchange data and information. Financially sound and bigger industries, such as the aerospace, chemicals and automotive industries started using EDI to communicate with suppliers (Choon et al., 2010). However, there were some limitations in the use of EDI at the time, due to its cost whenever expansion was needed (Choon et al., 2010). With the passage of time, such limitations were overcome thanks to reductions in the cost of technology and improvements in infrastructure (Nurhayati, 2014). This led to evolutions in web-based or internet-based commerce (e-commerce), with virtual organisations evolving to engage in the online buying and selling of products and services, instead of just communicating (Eistert, 2014). From the consumer's perspective, the biggest impact of online commerce was in the introduction of the electronic distribution of media and retailing (Nurhayati, 2014). Business experts and commentators soon grasped the future of e-commerce and how it would impact on and revolutionise business. Many definitions and models of electronic procurement have been introduced and technologies have been implemented to fit it within supply chain management. Many of these definitions cover the market mechanism and the coordination of e-procurement in B2B commerce and they are mostly generic: see, for example, Lip-Sam and Hock-Eam (2011) and Kian Chong (2010). A defined model of business-to-business (B2B) was introduced by Cullen and Webster (2007), based on the number of suppliers and buyers taking part in a business activity, but even this definition did not fully define the specific terms of e-procurement. Croom and Brandon-Jones (2007) developed a more acceptable model and definition of e-procurement terminologies by dividing the concept into six different structures by which communication and interaction take place between buyers and sellers. This division into structures provides a clear view of how various applications and solutions are deployed and how they work. Bof and Previtali (2010) divided e-procurement technologies into four structures, i.e. e-catalogue, e-auction, e-marketplace and e-procurement.

According to Chaffey (2002) e-procurement is the integration of all the procurement activities, such as the selection of products or services, requests for purchase, authorisation from management, ordering the products, delivering the products and making the payments. Rayport and Jaworski (2002) referred to e-procurement as B2B commerce with a web-based interface that allows procurement professionals in organisations to purchase products from the best suppliers and to manage all communications. Thomas and Singh (2001) stated that e-procurement takes place in the e-market where there are many suppliers available and where online bidding on digital catalogues, ordering, payment and product dispatch takes place. The e-market place and its various associated themes are explained in the following section. Does the business market is same as it was or is it changing. The answer is yes, we now have an e-market i.e. most of activities are taking place electronically, further detail is provided in the following section.

### **2.3.1 E-marketplaces and exchanges**

Malone et al (1987) introduced the concept of e-trading and discussed the role of the electronic market and its hierarchies. Their definitions are based upon and extracted from the work of Williamson (1975). In their definition, a market is a place where trading is affected by the price, quality and design of products by various competing business organisations and buyers have a choice of suppliers. However, in hierarchies, it is the managerial decisions that select and influence a supplier and not the aforementioned market forces to procure products or services that are either externally owned or vertically integrated. Malone et al (1987) predicted that the e-marketplace would be inevitable for the following two reasons:

- Corporations forcing suppliers to offer e-catalogues and databases in order for them to choose the best possible products;
- Collaboration between buyers and suppliers to communicate efficiently and effectively.

Clements and Northrop(2002) proposed the 'Move to the Middle' hypothesis, extending the work of Malone et al (1987), but suggested that buying firms will prefer to establish a long-

term association with a smaller group of suppliers instead of the whole market. This idea is supported and proved correct by Zhang et al (2011), with evidence stating that reputation and trust compelled firms to restrict themselves to fewer suppliers than the entire market. Gupta (2014) stated that e-markets reduce the costs of product searching and increase efficiency by eliminating intermediaries. He further stated that suppliers oppose the concept of the e-market because it brings increased transparency and reduces price margins. Martens (2013) noted that e-markets are instrumental in reducing cost by automating the entire process of order placement and processing, which ultimately proves that both buyers and sellers can benefit from this process automation. These benefits thus create a strong business case for e-markets. All these articles viewed the phenomenon from a theoretical perspective; however, the arrival of the internet made it a practical reality between 1999 and 2003. During this period, there has been bigger announcement and major electronic exchanges between suppliers and buyers (Huang and Benyoucef, 2013) However, in the early stages, most of the entities failed and only a few survived, due to lack of capital for investment in technology and lack of capability for mass transactions. More e-business taxonomies were introduced and businesses started thinking of diverse strategies to make an impact in the e-market. The concept of e-market segmentation surfaced, as mentioned by Strauss (2016): markets were classified horizontally based on industry types and vertically within the same industry based on size, price, quality and design. Further, Liu et al (2015) suggested that most firms will prefer private exchanges instead of mass inter-firm collaboration for the reason of security, trust and privacy: for example, the CISCO Corporation uses private exchange for procuring raw materials. Eng (2005), in his survey in the food sector, found that e-markets are used for procurement and transaction activities instead of supply chain management. However, in contrast, Zhang et al (2015) stated that e-markets can be used for strategic planning such as transportation planning, demand forecast and performance management. E-market uses various terminologies in connection with e-procurement which are discussed as follows:

### 2.3.2 E-procurement themes

A number of studies have been done and articles published on e-procurement since 1999, which has not only advanced the subject but also identified areas for research. Some of these studies on core e-procurement themes are as follows:

- **Adoption** (Gunasekaran and Ngai, 2008; Gunasekaran et al, 2009; Pearcy and Guiniper, 2008; Batenburg, 2007).
- **Implementation of E-procurement** (Croom and Brandon Jones, 2007; Shakir et al, 2007).
- **E-procurement success factors** (Angeles and Nath, 2007; Puschmann and Alt, 2005; Smeltze and Carter, 2001).
- **Supplier Issues** (Davila et al, 2003; Deeter-Schmelz et al, 2001).
- **Barriers** (Tanner et al, 2008; Angeles and Nath, 2007).
- **Integration** (Angeles and Nath, 20-07; Shakir et al, 2007).

The literature is continuously being updated and documented, covering various dimensions of the term and its process improvements. One key weakness of all these published articles in the literature, however, is that they have considered diverse mechanisms under the heading of e-procurement without taking into consideration the impact of those individual applications. From all the aforementioned papers and also Smart (2010b), the core themes of e-procurement research can be identified as communication, integration, supplier numbers, price compliance, relationships and supplier resistance.

Based on the above literature and the definitions provided by various researchers, the author presents the following definition that is suitable for the context of e-procurement adoption in Saudi Arabian SMEs. The adoption of e-procurement is not a static process as many vendors have made different solutions with distinct features. Some key e-procurement technologies are discussed below.

## **2.4 E-Procurement Technologies**

The previous section explained the limitations and issues with traditional procurement systems, which act as an obstacle to the development of many SMEs, and argued that a more innovative technological solution will help SMEs to meet the needs of the modern global business arena and gain competitive advantage over other SMEs in the market (Chang and Wong, 2010). First, in pursuit of innovation, the concept of the Inter-Organisational System (IOS) was evolved in order to improve communication amongst stockholders to meet the needs of the modern business arena. Before the internet became popular, organisations started using electronic data exchange via telephone lines to share and exchange important business information (Pani, 2007). Further, with the advent of EDI, standardised protocols were designed to provide deterrent functionalities for organisations, so as discussed by Pani (2007), IOT was the first step or type of procurement technology being used by organisations. Once the internet became popular worldwide, web-based technologies were developed to fulfil such functionalities in a more efficient manner. These web services are designed, specified and developed by the WWW Consortium and are standardised around the globe to avoid any confusion or conflict amongst stockholders (Garrido et al, 2008). These three technologies are discussed in detail as follows:

### **2.4.1 Inter-Organisational Information System**

IOIS is defined as a communication network amongst business partners to exchange and share information in a timely manner (Yang and Maxwell, 2011). Many researchers have discussed the advent and functionality of IOIS, such as Kaurema et al (2009). Subsequently, many other researchers have provided empirical evidence for the role of IOIS in business. Yang and Maxwell (2011) stated that the function of IOIS is to allow businesses to exchange information in an efficient manner. Further, Oliver and Maringanti (2008) stated that it allows stakeholders to exchange important documents using predefined rules and formats. This provided a foundation for the importance of communication between businesses and soon it was realised that a faster communication network between businesses is vital for their future success, especially between suppliers and partners.

## 2.4.2 Electronic Data Interchange

With the passage of time, IOSI developed into EDI, which is defined as a computer-to-computer exchange and transfer of information and documents using predefined standards and formats but does not involve monetary transactions (Pfeiffer, 2012). Musawa and Wahab (2012) defined it as an electronic transfer of business data from computer to computer using mutually agreed standards. It started in the US in 1968 when two companies exchanged information using a private network (Shaw et al, 2012). Many EDI standards have been developed over time:

- ODETTE: European automotive industry standards
- EDIFACT: UN standard used mainly in Europe
- UNTDI: UK retail industry standard
- ANSI ASC X12: US standards

EDI provides many advantages to businesses, such as reduction in lead time, less paperwork, facilitation of global purchasing, improved trust amongst suppliers and improved inventory management (Lysons and Farrington, 2016). However, EDI has some disadvantages too, such as transmission of static and cumbersome business data (Lysons and Farrington, 2016). It also lacks real time transactions, which is a big disadvantage (Oliver and Maringanti, 2008). It is however noted it has mostly been larger firms who benefited from EDI, as Leyland (1993) has noted that initially only powerful; bigger organisations used it as a means of getting strategic advantage. Also EDI is considered beneficial for bigger organisations with large volumes of data and electronic transactions. Some of the key barriers for the adoption of EDI in smaller or medium size enterprises as per Pfeiffer (2012), Musawa and Wahab (2012) and Sila (2013) are as follows

- SMEs lack of suitability to carry out real time transactions
- Expensive communication lines and equipments
- Higher implementation and maintenance cost

Pfeiffer (2012), has noted that EDI's inflexible nature makes it difficult to tackle changes in business conditions of the SMEs and is also considered inappropriate multiple round and complex interactions. Pfeiffer (2012) has further noted that though internet and worldwide web has made data transfer and communication easier yet, the software and its maintenance is still quite expensive.

### **2.4.3 Web Services**

With the advent of the internet, web-based EDI became popular in large organisations as well as SMEs (Tai et al, 2010). Web services are software standards that are designed to provide machine-to-machine exchange of information via a user friendly and easy to understand interface. Information is transferred using HTTPs and written in XML code. This information is serialized and compatible with other related web standards so that it can be easily used and accessed by all stakeholders (Tai et al, 2010).

Guruge (2004) has stated that Web services are self-describing and self-contained softwares that written using XML codes to provide standardised functionality for business. He has further stated that the use of XML codes is very important because it provides an architectural and conceptual foundation using different products and platforms. McWilliam et al (2013) has stated that Web services can solve system integration problems by loosely bonding all components, so these components can easily communicate with each other. These loosely coupled components can receive requests and send responses to clients using the imbedded standards.

According to W3C (2008), XML code in a webs services provides storage, description as well as transmission standards for the sata between components. Some of the key standards that are used for integration and transmission of XML based web services areas follows

- WSDL (Web Services description language)
- UDDI (Universal description and discovery language)
- SOAP ( Simple Object Access protocol)

The next section discusses how various technologies have been adopted over time and how they can be adopted now in detail.

### **2.5 Adoption of E-procurement**

E-procurement is an attempt to automate the traditional procurement system using various communication media to facilitate efficiently the process between different parties (Chang and Wong, 2010). The media include mail, fax, and phone, and the most advanced and recent are e-mail and the internet (Thun, 2010; Teo et al., 2009). This use of advanced



electronic technologies to develop a traditional procurement process into a more advanced one is called e-procurement (McCormack and Johnson, 2016) and (Hawking et al., 2004).

In order to meet the demands of dynamicity and the more competitive nature of the modern business world, the purchasing process in businesses has been transformed from a traditional clerical nature to a more strategic focus managerial function (Lutz, et al., 2010). IT has been the main driver in transforming business purchasing activities into a more value-added strategic business function (Davenport, 2013) and (Rajkumar, 2001). The two main reasons why businesses are looking to implement IT are because it makes the purchasing process more time efficient and less costly. In a survey conducted by Neupane et al (2012) and MacManus (2002), 85% of respondents thought IT would be time saving while 75% believed it to be cost effective. Similarly, Buchalcevova and Gala (2012) and Sharrard (2001) conducted a survey in Forrester Research Inc. and found that 45% of people in 35 local state governments believed that the use of IT had lowered printing/paper costs, while 43% thought the response and turnaround time was faster. Liu et al (2013) and Reddick (2004) found that positive support for e-procurement in the e-government development model for state management capacity and high performance was indicated. Many firms who have implemented e-procurement believe that they have gained financial benefits: for example, General Electric, a US firm, believes that it has saved more than US\$10 billion per year (Karjalainen, 2011) and (Hawking et al., 2004). Similarly, renowned global firms who have been using e-procurement for quite some time, such as Renault, Nestle and Motorola, all accept that the process has reduced annual costs hugely and has helped them to achieve a competitive advantage over other similar firms (Yu et al., 2008).

Similarly, the perception of risk is another very important determinant of the success of e-procurement adoption. Mose et al (2013) and Pavlou (2003) found that risk is either technology driven or caused by the environment or infrastructural weaknesses of the organisation, or there can be relational risks which arise as a result of the trading partners' behaviour. Behavioural risk or uncertainty arises when the supplier indulges itself in an opportunistic activity, taking advantage of the other trading partner (buyer), who is mostly impersonal and distant and is generally unaware of the underlying transactional activities and seldom monitors them. Such things not only pose a risk to the buyer but also shatter their trust in long-term business transactions. The organisation will therefore need to have a

proper monitoring system in order for e-procurement to work effectively and efficiently (Moncka et al, 2015) and (Mayer et al., 1995).

### **2.5.1 Definition of E-Procurement**

The term e-procurement came into prominence in the early 1980s when EDI was developed, which allowed suppliers and customers to exchange invoices and orders via e-mail and networks. This enabled people and businesses to synchronise and exchange their main files of product specifications and prices with customers and other stakeholders regarding fast-moving consumer goods.

E-procurement has been defined in many ways. Some of the working definitions of e-procurement are as follows:

*“The process of purchasing practices that utilizes electronic commerce to identify potential sources of supply, to purchase goods and service, to transfer payment, and to interact with supplier” (Min & Galle, 2003, p. 3)*

Baily (2008) has defined E-procurement as follows

*“E-procurement (electronic procurement, sometimes also known as supplier exchange) is the business-to-business or business-to-consumer or business-to-government purchase and sale of supplies, work, and services through the Internet as well as other information and networking systems, such as electronic data interchange and enterprise resource planning”*

Another very important definition by the Oxford College of Procurement and Supply (2016) states that E-procurement is:

*“The automation of procurement and supply chain processes using internet based applications and technology”*

From the above definitions, it is evident that e-procurement extends the conventional ERP system whereby the internal units and processes of an organisation are integrated and automated in order to prepare it for global integration and automation. The employees, once they are used to such internal automation, can participate and engage in global communication and procurement activities. Thus, internal use of internet technologies is a pre-requisite and shows the readiness of an organisation for future adoption of e-procurement.

According to the Chartered Institute of Procurement and Supply (2014), e-procurement is:

*“The combined use of electronic information and communications technology (ICT) in order to enhance the links between customer and supplier, and with other value chain partners, and thereby to improve external and internal processes. E-Procurement is a key component of e-business and e-commerce.”*

Keeping in mind the above working definition and the findings of Viet et al (2011), Azadegan and Tiech (2010) and Gunasekaran and Ngai (2008), it is evident that the use of fax, e-mail and local area networks represents the adoption of e-procurement at an earlier level and indicates organisational readiness for full adoption of e-procurement in the future.

The CIPS definition of e-commerce is very comprehensive and the author uses this definition to explain the current readiness and future adoption of e-procurement in selected Saudi Arabian SMEs.

Keeping the above working definitions in mind, the author will determine the current level of e-procurement adoption in selected Saudi Arabian SMEs based on their usage of technology.

According to Chipiro (2010), since the start of the e-boom in the 1990s, consultants, investors and executives have anticipated that e-procurement would play a central role in revolutionizing the way supply chain management and other business operations occurred. It was predicted that e-procurement would reduce the cost of procurement and enhance

the flow of information along the supply chain, and that, as a result, the bond between networked business organisations would become stronger and deeper(Maharan et al, 2011)Today, almost all businesses have adopted enterprise resource planning (ERP) systems, which are a strong foundation for e-procurement.

### **2.5.2 Importance of E-procurement**

An e-procurement system is intended to automate the business process, improve management of information and reduce cost. These functionalities can be achieved via specialised e-procurement or ERP software. Efficient e-procurement software will have most of the following features on offer for an organisationAlvarez et al (2012).

**Catalogue Management:** Must have the ability to create a new catalogue automatically or update and maintain an existing one. Should also be able to import a catalogue from a supplier firm (Phan and Vogel, 2010).

**Search:** The software must offer a searching facility based on keywords for products or services and should be able to apply filters for specific vendors or the location of suppliers Phan and Vogel, 2010).

**Authorization and authentication:** Roles and privileges must be maintained, so only authorised people should be able to carry out a specific action to maintain security and integrity of information (Phan and Vogel, 2010).

**Request for bids:** The software must provide facilities such as requesting and soliciting bids from many suppliers at the same time and categorise them based on price, quantity and other key characteristics (Phan and Vogel, 2010).

**Make Purchases:** the software must make automatic purchases from selected vendors as and when needed: e.g. when stock reaches a specific level (Ronchi et al, 2010).

**Check order status:** It must allow the managers and other authorised people to check the status of order at any time to exactly track where the order is and when it will arrive (Ronchi et al, 2010).

**Handle Goods in:** it must tackle refusals, partial orders and damaged goods.

Smith (2009) has noted that e-procurement is much the same as traditional procurement, having two distinct but connected ends: the internal end, which is the purchasing firm (via its own corporate intranet), and the external end, i.e. suppliers (via the internet). According to Shalle et al (2013) the benefits of e-procurement adoption for an organisation fall into two main categories, namely effectiveness and efficiency.

The former includes quality purchasing decisions, control over SCM and management of key procurement information, while the latter includes benefits such as faster procurement cycle, no unauthorised buying, reduced procurement cost, tighter integration and well organised information. Many researchers, such as Mohamed and Milimu (2016) and damavandi (2011) have further noted that e-procurement is intended to:

- Automate workflow within and across organisations
- Leverage spending and identify potential sourcing opportunities
- Improve communication within and across the organisation
- Reduce various administrative costs
- Reduce the order and fulfilment cycle
- Reduce goods prices and inventory levels
- Improve planning via technology and collaboration

It must, however, be noted that e-procurement does not replace procurement: it is a tool that increases the effectiveness and efficiency of the procurement process.

From the SMEs' perspective, e-procurement offers significant benefits and improvements in a number of areas, such as improved communication, efficient transactions and improved management of the supply chain (Smith, 2009). As per the research of the Aberdeen group (2007), e-procurement can potentially reduce the procurement cycle from an average of 7.3 days to days and can reduce administrative cost from \$107 to \$30.

E-procurement has recently taken centre stage in SCM and E-business among business executives due to the recession in the global economy and also due to its ability to

significantly reduce cost. Presutti (2002, p.220) has explained the need for e-procurement as follows:

*“The new basics of supply management require that supply chain managers take a more strategic view of what they do. Those new basics include a comprehensive understanding of target costing, value engineering, supplier understanding of target costing, supplier development, and electronic procurement”.*

Further, Hawkins and Stein (2003) have stated that:

*“E-Procurement will fundamentally change the dynamics between companies and their suppliers. The traditional 'purchasing' department will cease to exist. Its focus, instead, will be on understanding the requirements and therefore being able to drive the business forward, coordinating information exchanges and improving relationships with suppliers by managing them more efficiently and developing negotiation and sourcing strategies”.*

From the above, it can be noted that e-procurement is the way forward for SMEs and can significantly improve their operations and productivity.

There are three main determinants of e-procurement:

- Managerial competence in demand management: the firm’s ability to search existing and future markets where it can sell products or services now or in the future.
- Transformational competence: the firm’s ability to convert input into outputs more efficiently through some value added measures.
- Supply and procurement management: This refers to how efficiently a firm can get required inputs and produce the needed outputs.

The type and amount of benefits an organisation can get from e-procurement depends on the type and size of the organization. A manufacturing organization is more likely to get more benefits, as it needs a lot of raw material from suppliers at all times (Zunk et al, 2014) and (Cox, 2001). Generally, the implementation and adoption of e-procurement changes or modifies the way a firm operates. The changes extend from the organisational level to financial and information system departments (Karthik and Kumar, 2013) and (Boer et al, 2001). Similarly, after the implementation of e-procurement, new activities start in the firm,

such as the use of new technology in the Information department and new learning and training needs for people. Rainer et al (2013) and Frohlich and Westbrook (2001) believe that once integrated with a legacy system, the e-procurement process increases its efficiency and reduces the cost.

### **2.5.3 Benefits of e-procurement**

Many potential benefits of e-procurement adoption have been reported in the literature. Most commonly discussed of these benefits are transaction cost, process shortening, price reduction, improved control and improved communication. Davila et al. (2003) stated that e-procurement offers both strategic and operational benefits, but the latter are more pronounced. Other researchers have highlighted the benefits of e-procurement, as well such as Croom (2000), who stated that e-procurement offers both strategic and operational benefits and listed a detailed account of those benefits. Attaran (2001) stated that e-procurement offers strategic, operational and other opportunities for businesses. De Boer et al. (2002) divided e-procurement benefits into tactical, strategic, operational, direct and indirect benefits. Bartezzaghi and Ronchi (2003) categorised e-procurement benefits into effectiveness, process efficiency and market efficiency. Subramaniam and Shaw (2002) stated that e-procurement adoption results in immediate performance measures and efficiencies. Bendoly and Schroenherr (2005) stated that e-procurement adoption leads into process efficiency and waste reduction. Guasekaran and Ngai (2008) have listed many long and short term benefits of e-procurement adoption and have stated that it affects alliance and networking, cost performance, competitiveness and improved organisational performance. Schoenherr and Tummala (2007), however, have not categorised the e-procurement adoption benefits but have stated several them, such as improved and efficient negotiation, reduced transaction costs, workflow automation, selection and identification of suppliers, improved control and co-ordination, improved transparency and monitoring, improved control and leverage on spending. Due to increasing competition in the global market, businesses place supply chain management (SCM) at centre stage in order to compete and stay profitable in the market. The research by Dada (2012) concluded that the Internet plays a vital role in reducing the cost and increasing the efficiency of supply

chain management. He echoes that e-procurement boosts competitiveness, reduces costs and increases the profitability and performance of organisations. He further stated that e-procurement facilitates real time across all internal and external stakeholders and thus can overcome the limitations and issues with traditional procurement systems, such as the key issue of production due to poor specification and timely delivery and purchase of products. The first step in e-procurement was the use of EDI, which was identified as a valuable source of competitive advantage by Karjalainen (2009). In EDI, business transactions are carried out via the use of structured messages using public telephone lines or a Value Added Network Chang (2008). Even simple EDI provides a lot of benefits over traditional procurement systems, such as:

- Faster and more efficient transmission of data and information;
- Reduced cost of information transmission;
- Improved operations management within both the firm and its suppliers;
- Enhanced and improved positioning of the organisations.

A number of researchers have highlighted the aforementioned benefits, such as Nawi et al (2014) stated that e-procurement is an efficient process that automates business transactions, reduces cost, improves management and brings transparency in business processes. He further stated that traditional procurement is labour intensive and prone to errors, which are very costly for the business in both the long and the short term. From the aforementioned benefits it is evident that they are equally significant for SMEs in spite of their limited human and financial resources provided that the system is designed as per the needs of the SME and the management is willing to take the SMEs forward in terms of growth and revenue. The significance is evident from the research of both Narayansamy et al (2008) and Gunasekaran et al (2009). Based on the above literature provided by various researchers, detailed benefit of e-procurement adoption are listed in section 2.5.4.



#### **2.5.4 Key challenges of e-procurement adoption**

There are many challenges mentioned in the academic literature related to e-procurement adoption. Dai and Kauffman (2002) indicated some of the key challenges in e-procurement adoption, which are:

- The lack of readiness of the marketplace for B2B activities, particularly those related to e-procurement exchanges.
- Inequities among trading partners in the e-market place as more power lies with the bigger and more experienced firms.
- The difficulties in establishing a single point of contact with bigger, multi-unit supplying firms.
- Integration issues in cross-enterprise systems.
- Lack of trust and reluctance to share information among trading partners.
- Specific SME issues, such as lack of capital to participate and compete with larger firms in e-market bidding as it depends on transaction volumes.

Kheng and Al-Hawandeh (2002) mentioned some of the key challenges in their research into firms in Singapore, which are:

- Concerns about the security and privacy of information exchanges
- Investment in electronic devices and human resource hiring development
- Lack of laws, or inconsistency in laws related to e-procurement e.g. the legality of e-mail contracts
- Technical difficulties in information exchanges and lack of standards

Similarly, in his research where he interviewed more than 20 suppliers, Zhu (2002) found that they were concerned about their profit-making ability through data exposure in the e-market, buyer pressure on price reduction and margin erosion. Detailed barriers of e-procurement adoption are listed in section 2.5.5.

### **2.5.5 Benefits of e-Procurement to SMEs**

Researchers have mostly concentrated on the benefits of e-procurement for larger organisations but it is equally beneficial for SMEs as well. Some of the key benefits as mentioned by Toktaş-Palut et al (2014), Eei (2012) and Abid et al (2011) are as follows

- Access to a wider pool of suppliers thereby overcoming suppliers monopoly
- Provide them access to wider pool of customer and a chance to start business in another place with potential customers
- Reduction in cost acquisitions
- Increased efficiency in selling and acquiring processes
- Increased transparency and business intelligence which leads to evolution
- Increased collaboration with various stakeholders

According to Aberdeen (2007), e-procurement is a mean of extending SMEs from a mere buyer to a selling partner. He further stated that there is no other innovative process that can affect an SME more than e-procurement in modern business arena. Davila et al (2003) has stated that e-procurement based purchasing consortia are best suited to the needs of SMEs. New et al (2002) has noted that the benefits of e-procurement are not same for all SMEs and varies depending on the size and type (e.g. construction, service oriented, manufacturing etc) of the SMEs and also the country where they operates because in some country SMEs might not be able to achieve full benefits of e-procurement due to inherent barriers in that country.

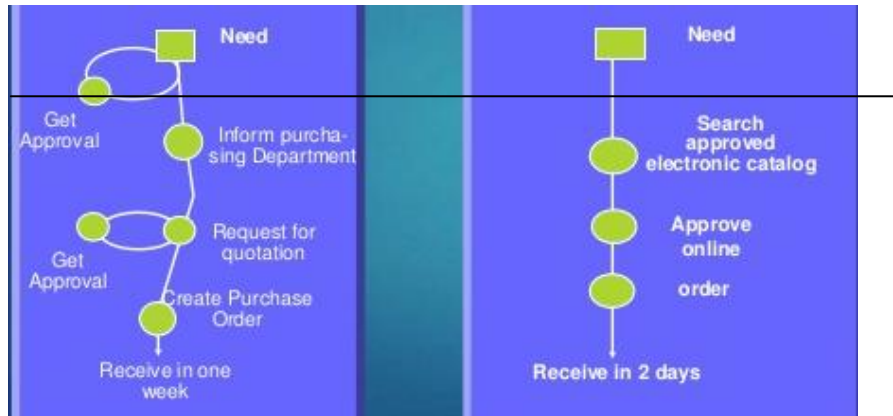
### **2.5.6 Connections between E-Procurement and Procurement**

The key benefit of e-procurement is that it provides a centralised location for data entry: all data need to be entered in one place and not into multiple locations. E-procurement makes data exchange efficient and communication is improved as a result. Exchange or transfer of documents becomes faster, and at the same time, mistakes in data transmission are eliminated. In the absence of e-procurement, the company might need to employ two or three times more people in procurement activities than when an e-procurement system is in place (Gunasekaran et al. , 2009). E-procurement makes order tracking very easy and order shipment, current status and delivery can be easily tracked. Sales and purchase

departments both have the most current form of data, which is often not the case in traditional manual procurement systems. In the absence of such systems, sales personnel need to engage in extensive communication with the purchasing department and answer a lot of queries from them, which are eradicated in e-procurement systems. It also allows sales people to answer any questions in a blink of an eye if needed just by logging into their computer system (Kurbel, 2013) and (Gebauer, 2002). The procurement system must therefore be comprehensive enough to respond to multiple platforms that potential customers are using and have their own specific formats and interfaces (Malik, 2014) and (Bedell, 2002). A lot of suppliers or manufacturer around the world, particularly in the developing world, still use the old traditional paper-based system and do not have the digital format that is required for e-procurement to be successful (Aboelmaged, 2010). Instead of upgrading the current system, many vendors prefer to provide a new e-procurement system, which is likely to be costly, whereas the supplier will prefer to follow the old one evidence indicates that 65% of the time, employees complies with the company's terms, but on 22% of occasions companies fail to comply and thus will have to incur more costs than they would normally have to (Lee and Wang, 2013) and (Aberdeen, 2006). Similarly, some of them will not have the skilled staff to operate these systems or might not want companies to leverage price concessions and will therefore avoid them (Islam, 2015) and (Singer, 2003).

The following diagram shows a graphical comparison of traditional vs. e-procurement, while the table that follows provides a detailed comparison of the key purchasing characteristics of the two processes.

***Graphical Comparison of traditional procurement vs. E-procurement***



**Table 1: Source: Anderson and Gaile-Sarkane (2015)**

## Comparison of Traditional vs. Electronic Procurement

<i>Features</i>	<i>Traditional procurement</i>	<i>Electronic procurement</i>
<b>Product selection</b>	Search a large catalogue of products to choose from	Personal views, shopping lists and templates online
<b>Authorisation and requisition</b>	Multiple levels of authorisation and approval, which take a lot of time	Automatic approval based on certain well-defined business rules (fast)
<b>Product order transmission</b>	Post, E-mail or Fax, where supplier has to retype the order data upon receipt	Online order dispatch and automatic update of order status and details via a central hub
<b>Payments</b>	Involve a slow three-way approval of product orders, matching invoices and receipts	Very quick, based on receipt of notice
<b>Analysis</b>	Ad hoc	No link to supplier performance

Adopted from Anderson and Gaile-Sarkane (2015)

From the table, it is evident that an organisation can obtain several benefits through the adoption of e-procurement. First of all, product selection and searching is easy, as the customer is directed straight to the products s/he is interested in, instead of having to explore a large list of various suppliers' catalogues, and the comparative prices are listed so that s/he can choose the best one. In this way, a lot of time and administrative cost can be saved. Soares-Aguiar and Palma-dos-Reis (2008) have proved that automatic selection and requisition reduces administrative cost by 33% as compared to traditional procurement systems. They further stated that automatic requisition is where the cost is greatly reduced and significantly affects the organisation's net income. Croom and Brandon (2007) has stated that establishing an inter-organisational network significantly improves organisations' order processing efficiency, which reduces the cost of inventory management via its just-in-time method. Kim et al (2015) stated that various tactical business activities, such as product selection, specification, acquisition and contracting, improve and cost is significantly reduced. They demonstrated this by analysing the cost-to-benefit and revenue-to-benefit

ratios of a business before and after e-procurement adoption and found significant financial leverage for business (Hsin et al, 2013). They further found that e-procurement honours end-user contract status and allows the business to negotiate on price reductions via enhanced capture, increased confidence, reliability of spending information and increased compliance with the system. Furthermore, it allows the business to control its cash flow via efficient electronic payment, which increases the efficiency of the accounts department by reducing the manpower needed to handle transactions. Similarly, electronic invoicing can be maintained, which can be seen by both the business and suppliers, making the process fair and transparent (liu et al, 2013).

Mahdillou and Akbary (2014) gave the example of the Trading Process Network (TPN) of General Electric's employee e-sourcing, which significantly reduced the company's costs. In TPN, the purchasing department asks for proposals over the internet from pre-qualified suppliers who place their bids and then the best one is chosen after necessary negotiations. TPN takes care of operational processes automatically via electronic transactions, reducing all operations associated costs. TPN reduces the cost by between 5% and 20% by finding new suppliers and performing automatic requisition, payment and order processing. SAP ERP has added capabilities which automate and affect various business processes such as HR, accounts, sales, purchasing etc. Similarly, Oracle's "Procure to Pay" is another good example that can handle the whole procurement cycle from automatic selection and payment to cost and spend analysis, and claims that a 10% to 20% reduction in cost can be achieved depending on the type and size of the business (Monczka et al, 2015). This can further reduce the costs of time to market and inventory storage, as goods can be ordered based on demand and spending analysis. Dell is another famous electronics company that has found that updating daily demands and tallying them with inbound supply flow is significant for its business success because it reduces various acquisition, processing, transaction and storage costs (Qrunfleh and Tarafdar, 2014).

## **2.6 E-Procurement Model**

From the broader e-procurement literature, the following are prominent e-procurement models in the e-market place from which organisations can choose.

### **2.6.1 Buyer Model (few Buyers, many suppliers)**

This model is suitable in circumstances where there are many suppliers. In such situations, a buyer can influence the relationship with suppliers using reverse auction tools. A reverse auction is a situation where the lowest bidder wins the contract. In such auctions, a buyer sets a lowest price for a product and puts it forward to the suppliers. If they are willing to accept it, the supplier who accepts the lowest bid wins the contract to supply the product. This is contrary to the English auction, where the supplier offers the product and the highest bidding buyer wins the contract. In this model, the supplier can gain maximum benefit in terms of quality, price and product delivery (Singh and Thomas, 2002).

### **2.6.2 Marketplace Model**

In this model, value is created via third party mediation between the sellers and the buyers. As per Kaplan et al. (2000), this model is suitable for spot buying of core and non-core products in the same or cross industries (non-core purchasing means stationary, hotel rooms for employees, cleaning products and services etc.). This model represents a many-to-many relationship i.e. many buyers and many sellers. In such a situation, the total revenue of the e-market increases and the focus is on price, which sometimes has repercussions e.g. the need for new skills (Singh and Thomas, 2002).

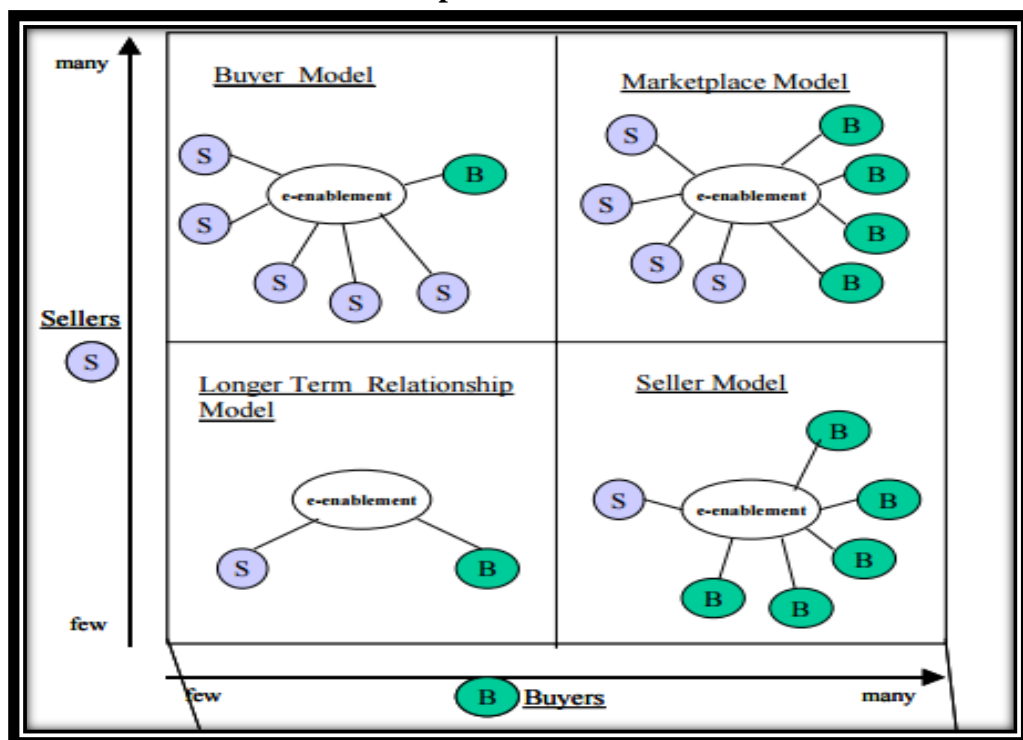
### **2.6.3 Longer Term Relationship Model**

This is a one-to-one model, where there is one buyer and one seller, and it requires the highest degree of precision in design for buying and selling of strategic items. Planning is important to reduce complexity and to fulfil demands quickly. The benefits of this model are the reduced time cycle and the stronger bond between the buyer and the seller, as they are part of one supply chain. It ultimately improves customer service and reduces any types of risk, as both parties are well known to each other. In such a model, price is less important than supply assurance (Singh and Thomas, 2002).

### 2.6.4 Seller Model (few sellers, many buyers)

The seller model is the opposite of the buyer model, where there are few sellers and many potential buyers of a product or service. In such a model, the seller offers a 24/7 buyer catalogue and manages the web contents solely at its expense. This kind of model is more suitable for SMEs due to their reduced finances. In such a model, the seller has the monopoly as buyers can be forced to pay for their technology integration into suppliers. The supplier offers a product, the buyer makes bids and the highest bidder wins the purchasing contract (Singh and Thomas, 2002).

Potential E-procurement Models



Source: Singh and Thomas (2002)



## **2.7 Overview of different Innovation Adoption Models**

In the last few decades, considerable research has been conducted regarding the adoption of technology in different contexts (Venkatesh et al., 2000; Gefen et al, 2003). Studies have used various terminologies, such as ICT (Information and Communication Technology), IS (Information System) and IT (Information Technology). However, these terms are not different from one another and are used interchangeably whenever referring to technology. Similarly researchers have used various models from social, psychological and behavioural contexts to build a theoretical foundation for their research (Swanson, 1982). From this, it is evident that various studies on IT, ICT and IS adoption can be applied to this current study. Some of the most widely used models in this context are DOI (Diffusion of Innovation), TRA (Theory of Reasoned Action), SCT (Social Cognitive Theory), TPB (Theory of Planned Behaviour) and TAM (Technology acceptance model, formulated by Rogers (1962, 2003), Fishbein and Ajzen(1975), Compeau et al. (1999), (Ajzen, 1985) and Venkatesh and Davis(1996) respectively.

This research extends an insight into the investigation of behavioural, social, cognitive and affective factors affecting the adoption of e-procurement in Saudi Arabian SMEs. The study evaluates these models and undertakes comparisons with Gunasekaran and Ngai (2009) to justify its validity and efficacy in investigating the factors affecting the adoption of e-procurement in Saudi Arabian SMEs. Gunasekaran and Ngai's (2009) model has been used as theoretical foundation for the current research. A detailed account of these models is presented below

### **2.7.1 Technology, Organisation and Environment (TOE)**

The TOE model was formulated and first used by Tomatzky and Fleischer (1990), and has subsequently been used by many researchers to investigate the factors affecting the adoption of e-commerce in SMEs. From the literature, it can be found that the TOE is a good model for investigating context-based factors that affect the adoption of E-commerce (Tomatzky and Fleischer, 1990). It provides an ideal framework for investigating the adoption and usage of e-commerce in a specific firm context. Several researchers into the adoption of e-commerce, such as (Awa et al, 2015) and (Grover and Goslar, 1993), Al-

Qarim(2007),Almoawi (2012), (Ifinedo, 2011) and (Kuan and Chau, 2001) and Sophonthummapham(2008) have all stated that the TOE model provides an ideal structure and foundation to investigate factors that are considered vital for the successful adoption of e-procurement.

The organisational context takes into consideration all internal issues and managerial skills vital for successful adoption of innovative technology (Tomatzky and Fleischer, 1990). Many researchers have found organisational context extremely important for the successful adoption of innovation: for example, (Awa et al, 2015) and Grover and Goslar (1993) found that organisational size, formalisation and centralisation were vital organisational context elements for the adoption of telecommunication technology by SMEs. Similarly, Al-Qarim (2007) also found various factors in the organisational context vital for the adoption of innovative technology, such as the presence and complexity of IT infrastructure, management size, and satisfaction with the current system, formalisation of the system, the existence of an IT department, top management support, managerial time and product characteristics.

The technology context takes into account various types of technological issues within and outside the organisation that contribute to smooth adoption of technology (Tomatzky and Fleischer, 1990). Many researchers have investigated the technological context: for example, Yeboah-Boateng and Essandoh (2014) and Al-Qarim (2007) and Chang-Shuo (2006) examined the barriers and benefits to the adoption of telecommunication and other technologies and their complexity, compliance and compatibility. Again, all these studies have failed to provide evidence for the cultural impact in the technology context.

The environmental context takes into consideration various issues related to the industry, customers, suppliers and government (Tomatzky and Fleischer, 1990). Researchers such as (Awa et al (2015) Grover and Goslar(1993),Ramadani et al (2013)Chau and Tam (1997) and Al-Qarim(2007) have investigated various aspects of the environmental context, such as government support, competitors' pressure, technology standards and current infrastructure in relation to the adoption of ICT in organisations.

### **2.7.2 Theory of Reasoned Action (TRA)**

This model has been widely used in social psychology to determine consciously intended behaviour of individual (Ajzen and Fishbein, 1980). According to Fishbein and Ajzen (1975), behaviour is jointly predicted by social influence, attitude and intention variables. The TRA hypothesizes that subjective norms (SN), which refers to what other people in the group or context think about an individual behaviour, and individual attitude towards performing a specific behaviour (ATB) collectively determine behavioural intention (BI) i.e.  $BI=ATB+SN$

Many authors, including Hameed et al (2012) and Bock and Kim (2002), have found that there is a strong relationship between TRA factors and their importance in determining individuals' behaviour or attitude towards a specific application or object. The study was very significant in finding a positive relationship between intention towards knowledge sharing and actual knowledge sharing. It is thus also relevant in finding management, staff and other stakeholders' attitudes towards the adoption of innovative technological application such as e-procurement.

### **2.7.3 Technology acceptance Model (TAM)**

The investigation of acceptance of technology by users has attracted many researchers ever since computers first emerged in the early 1980s. It has been given various terms, such as ICT adoption, technology acceptance and Information System implementation in the wider information system literature in last three and a half decades (Alam et al, 2009). The TAM was developed by Davis (1986) to describe the acceptance of technology by users in various contexts. It was built on the TRA (Theory of Reasoned Action) on the perception that it eases work for users in wider contexts. It is thus built on the belief component of TRA.

In the context of an SME or any other organisation, the usefulness of technology can be related to its direct or indirect impact on user performance, whether resulting in non-material or material profits. According to Davis (1986), perceived ease of use is another very important component which refers to the way in which difficult and stressful work can be made easy as a result of technology adoption.

#### **2.7.4 Theory of Planned Behaviour (TPB)**

The TPB is an extension of the TRA developed by Ajzen (1985), who incorporated behavioural intention and perceived behavioural control. The TRA had an inherent limitation of taking performance failures into consideration to tackle situations beyond the behavioural control of individuals.

This model states that subjective norms (SN), attitude (A) and perceived behaviour control (PBC) collectively determine behavioural intention i.e.  $BI = SN + A + PBC$ . The model has generally been supported by empirical evidence and researchers like Ajzen and Driver (1992), Rana et al (2013) Doll and Ajzen (1990) and Chau and Hu (2001) have successfully predicted individuals' behaviour towards knowledge sharing and innovation using TPB.

#### **2.7.5 Diffusion of Innovation (DOI)**

Rogers (1995, p.11) has stated that innovation refers to an object, idea or practice that is perceived as new by an individual or organisation. Similarly, Rogers (1995, p.5.) defines diffusion as

*“Process by which an innovation is communicated through certain channels over time among the members of a social system”*

Roeger (1995) has further stated that an innovation is adopted only if it is feasible for the organisation in terms of money and expertise, is not complex, is compatible with the existing technologies and standards in the organisations and last but not least if its advantages for the organisation can be foreseen. As per this model, the adopters of innovative technology are categorised as early adopters, innovators, late adopters, early majority adopters and laggards. Zott et al (2012) Baskerville and Pries-Heje (2001) understand that innovation happens in an unstructured manner and is stimulated by an internal or external clock rather than a planned rational stepwise process. Rehman et al (2012) Wejnert (2002) has stated that adoption is not a uniform process and varies with the nature of innovation itself, the environment and the innovators i.e. an individual or organisation.

### **2.7.6 Social Cognitive Theory (SCT)**

Social cognitive theory is another very important theory that takes into consideration personal, environmental and behavioural influences to create a learning paradigm necessary for the adoption of innovative technologies. According to Bandura (1986) and Pajares (2001), it is neither internal nor external forces that influence individual adoption of innovation but rather performance attainment targets nor self-beliefs that change individuals' performance.

### **2.7.7 Comparisons between Innovation Adoption Models**

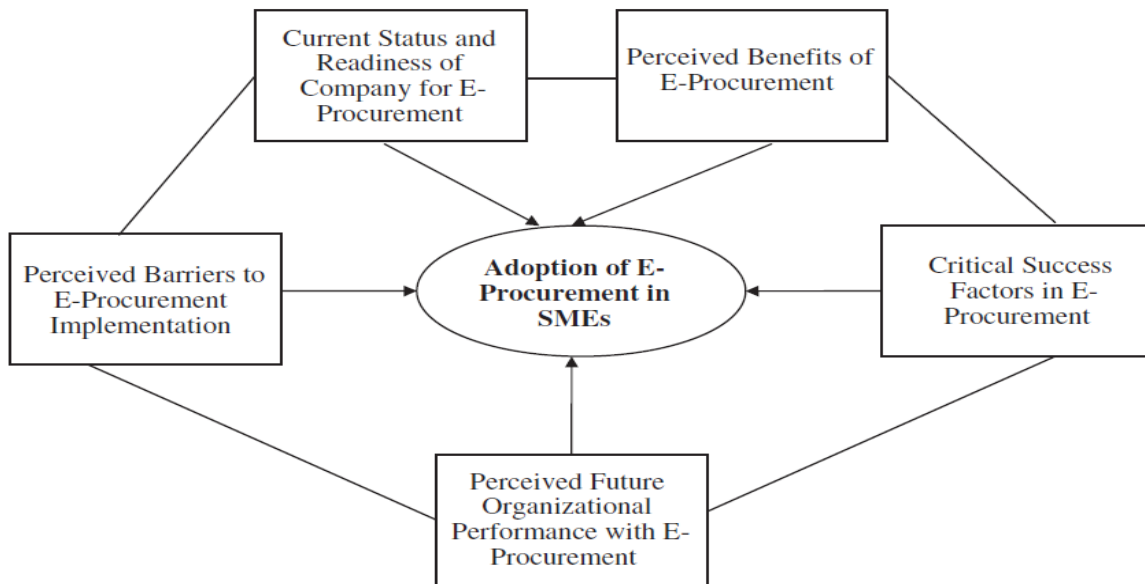
The aforementioned models have been extensively used in the literature, either alone or in conjunction, to understand the adoption of technology in business. A lot of studies that have been conducted using these models have been reviewed to understand the adoption of technology and the limitation of these models.

Researchers have used both the TOE and the DOI model for adoption of innovative technology but TOE had an added advantage of taking environmental context into consideration, which is very important because it addresses intra-firm issues and is therefore more consistent. Some researchers, such as Iacovou et al. (1995), have advocated the use of both models together. The TAM is more popular than the DOI, but that is because it is specifically used in the technology field, while the DOI is used in a wider context (Al-Zaubi, 2013) and (Lyytinen & Damsgaard, 2001). The present study, however, prefers to use the Gunasekaran and Ngai (2009) model, for reasons that are mentioned in the next section.

## **2.8 Gunasekaran and Ngai Model: A Theoretical Framework**

As discussed by Al-Shehri et al (2012), IT adoption faces many challenges (barriers) in Saudi Arabian SMEs. One key barrier in this regard is the lack of people who are skilled and knowledgeable about IT and have awareness about E-commerce and other IT tools such as e-procurement (Abdallah and Albadri, 2010). This research has adopted the Gunasekaran and Ngai (2009) model, initially used in Hong Kong in 2008 and later on the south-east coast of the USA. The model will be applied in selected Saudi Arabian SMEs to understand their current status, perceived benefits, perceived barriers, critical success factors and perceived

future performance from e-procurement adoption. Through extensive literature research, the researcher found that the factors mentioned in the Gunasekaran and Ngai (2009) model are relevant to the adoption of e-procurement in SMEs and can be applied in the Saudi context.



Work flow in adoption of E-procurement in SMEs (Source: Gunasekaran and Ngai 2009)

### 2.8.1 The Efficacy of the Model

The Gunasekaran and Ngai (2009) model is ideal for the study, as it extends the TOE model to include critical success and future organisational performance factors and also compliments the TAM and TPB models by including the perceived risk, trust and other behavioural elements, as well as the DOI model by including the knowledge, skills and ease of use elements. Further the studies conducted by Gunasekara and Ngai (2009) on the south-east coast of Massachusetts, USA, Narayanasamy et al. (2008) in Malaysia and Engström et al.(2009) in Sweden, it is evident that the model elements are relevant for the adoption of e-procurement. Similarly, it is also evident from the studies that organisations which have already adopted e-procurement have been shown to benefit easily and encounter fewer barriers (Abid et al., 2011). In contrast, organisations that have not adopted e-procurement

will potentially face more barriers and lower productivity (Ongori and Migiro, 2010). The management and staff of organisations that have already adopted IT innovations will potentially be less reluctant towards e-procurement adoption because they are already aware of the benefits of technology (Eei et al., 2012). Thus, these issues may serve as critical success factors.

### **2.8.2 Why the Gunasekaran and Ngai Model?**

- The framework highlights the benefits and importance of e-procurement issues.
- The framework highlights critical factors for the success of e-procurement adoption.
- The study identifies issues specific to SMEs.
- This model compliments the TOE model and extends it.
- The TAM and TPB (Theory of Planned Behaviour) models are not suitable for the investigation of strategic level acceptance of technologies to adopt e-procurement because, as explained by Robertson et al. (2011), these models are suited to understanding and predicting behaviour and the acceptance of innovation at an individual firm level. They are not appropriate at a corporate or national level, where there can be variations in planned behaviour and in the ease with which innovation is accepted. Similarly, Khan and Woosley (2011), in their detailed comparison of various innovation models, have concluded that these models are effective at the individual firm level of acceptance of technology but not at the broader, or strategic, level.
- Another important reason for using the GN (2009) model is because there has been wide criticism of the TAM model by scholars, due to its assumptions that perceived usefulness and perceived ease of use are the main decisive factors in users' acceptance of technology (Park et al., 2008). For example, Davis (1989) argued that other factors, in addition to perceived ease of use and perceived usefulness, must be explored in relation to the effects on users' acceptance of technology in various contexts. Thus, researchers have concluded that the TAM model is limited in power and must be extended to include other factors to better understand users' intentions in accepting technology (Lopez-Nicolas et al., 2008). Various researchers have used TPB to predict intention to use new technology, such Harrison et al.

(1997), who used it to predict SME executives' decisions to adopt Information systems in their businesses. However, according to Ramdani (2008), TPB is less parsimonious and needs unique operationalisation in the various situations where it is applied.

- The author has, therefore, used the Gunasekaran and Ngai (2009) model; because it has previously been used on the south-east coast of the United States (US) in 2009 and in Hong Kong in 2008, and it combines the characteristics of the TOE and TAM models to effectively predict the acceptance and adoption of innovation.

## **2.9 Current Status and Readiness of SMEs for E-procurement**

According to NePRA (National e-Procurement Research Project Australia), readiness refers to the current use and expected future level of adoption of e-procurement (Basri and Dominic, 2010). They further state that the readiness of an organisation and its technological infrastructure are critical determinants of successful e-procurement adoption. E-procurement changes the way a business operates and interacts with suppliers as well as customers and changes the arduous manual approach to dealing and making orders to simple clicks of the mouse (Chien and Ahrens, 2001). Organisations can expand and get competitive advantage in the current dynamic business world, thereby grabbing maximum market share in their industry of expertise. They can benefit from global suppliers and at the same time can make progress in the global business world (Basri and Dominic, 2010).

The readiness of any firm for e-procurement depends upon three main factors, namely technological factors, environmental factors and organisational factors. Relatively large and managerially innovative firms are easy to adapt to e-procurement (Moon, 2005). Knudsen (2003) states that the readiness of a firm for e-procurement depends on the availability of skilful employees and their willingness to support the change, the availability of technology and the e-procurement process itself.



### **2.9.1 Technological Readiness**

The technology perspective of readiness refers to all available innovative technologies the firm needs to use for e-procurement and other e-business activities. It includes the technological equipment currently available within the firm and also in the market that the firm can access and use. It will also need an evaluation of the current technologies being used and whether or not they are compatible with new technologies in addition to the installation of new innovative technologies available in the market (Gunasekaran et al., 2005). Rogers (1995) understands that when evaluating future innovative technology for firms with respect to e-procurement and e-commerce, their compatibility, advantages, observability, trial ability and complexity must be taken into account. He further states that compatibility refers to technological fit with the current equipment and technical and organisational resources of the firm. The advantages will include perceived future impact on business and operative and transactional benefits for the firm. Observability refers to how the firm's management and other technical staff perceive the new technologies and what advantages and benefits they force for the firm. Trialability is the degree or extent to which the equipment can be pilot tested before being actually adopted and complexity refers to how easy it will be for the firm's current and perspective staff to use it. All these factors will help in making a decision to adopt these new technologies. From the studies of Gunasekaran et al., (2005) and Scupola (2009), it is evident that these technological perspectives are key to the successful adoption of e-procurement and other innovative technological practices for the firm.

### **2.9.2 Organisational Readiness**

The context of organisational readiness is very important for the adoption and implementation of any innovative processes (Tomatzky and Fleischer, 1990). However, top management support is another very important factor that is necessary for the successful adoption of e-procurement and other innovative processes (Sabherwal et al., 2006). Similarly, the method of communication an organisation uses to transfer knowledge is another important factor that is often referred to in the literature and is necessary for the successful adoption of any innovation (Rogers, 1995). According to Dholakia and Kshetri (2006) and Sabherwal et al. (2006), employees' knowledge of Information technology, CEO

characteristics and vision, employees' attitude and top management support are central to the successful adoption of e-procurement and other technological innovations. Yu(2005) understand that financial and human resources of the firm are also very important for the successful adoption of technological innovations. Top management favourable attitude towards innovation and technology and employees' previous experiences within the organisation or previous organisations play a vital role in the successful adoption of e-procurement (Sabherwal et al., 2006).

### **2.9.3 Owner and Manager Characteristics**

The literature has given great importance to the features and characteristics of organisations' managers in the adoption of e-procurement and other ICT solutions in SMEs (Caldeira and Ward, 2002; Looi, 2005; Bharti and Chaudhry, 2006). The managerial factors or characteristics of the owner/manager are related to the executive decisions being taken regarding financial commitment, acquisition of new infrastructure, deciding on the overall direction of the firm, the adoption of new and innovative technologies and the implementation of e-commerce and e-procurement. The main challenges or issues arise when the manager or owner is reluctant to adopt innovative technology and ICT solutions such as e-procurement. An enthusiastic and intelligent manager will always seek and implement new technologies and bring innovations to make the SME grow (Karakaya and Shea, 2008). Many researchers have found a positive relationship between SMEs' growth and the application of new ICT tools, which depends directly on the owner/manager's attitude and acceptance of change. The role of owner and managers is very significant in fostering a suitable environment for innovation and ICT adoption (Wilson et al., 2008; Cloete et al., 2002). Some of the most relevant and important characteristics of managers and owners are as following paragraphs.

### **2.9.4 Education Level**

It is very important for key personnel within SMEs, especially managers/owners, to have an acceptable level of education to make the adoption of new ICT solution such as e-procurement as smooth and effective as possible. Sarosa and Zowaghi(2003) and Thong

(1999) have found that successful adoption of innovative technologies requires a certain level of education skills on the part of owners and management. GCSE, GCE or other equivalent level of education is a must for key management personnel and owners to allow them to appreciate and accept the importance of new ICT solutions and realise their importance for the firms. It will also allow them to smoothly communicate such changes and get feedback in the SME hierarchy and also with other businesses internationally. It has been found that most of the managers and owners in developing countries such as Saudi Arabia cannot speak and communicate in international language, which hinders their access to the international market.

### **2.9.5 Level of ICT Knowledge and Skills**

Due to their better infrastructure and resources, SMEs in developed countries have managers/owners with better education and level of ICT skills and knowledge as compared to those in developing countries such as Saudi Arabia (Eriksson et al., 2008). Molla and Licker(2005) understand that the failure to adopt ICT-based solutions in developing countries is due to the low literacy rate and the level of managers/owners ICT skills and knowledge in addition to infrastructural and resource challenges. SMEs in developing countries therefore cannot grasp the opportunities to adopt innovative technologies and hence drive towards access in the international market and growth. Duncombe and Heeks(2002) found that lack of resources, access to information and lack of knowledge and skills of managers hinder SMEs in developing countries' attempts to embrace ICT-based solutions(Duan et al, 2002). A study conducted by Wilson et al. (2008) on UK SMEs found that the role of skilled people was crucial for the success of an SME. They further revealed that such skills were more critical than the financial resources in the firm.

### **2.9.6 Security, Privacy and Trust Concerns**

Security, privacy and trust-related issues are critical for the successful adoption of e-procurement (Bharat and Abhijit, 2010; Humphrey et al., 2003). Security concerns hinder people from engaging in online transactions and they feel more secure about accepting e-mails without online payment (Karanasios and Burgess, 2008). The assurance of trust in

software can either be provided by the vendor, the ISP or a third party such as PayPal in an online transaction (Kim and Benbasat, 2009).

### **2.9.7 Cost Implications and Financial Ability**

The issue of financial resources is among the most common in many SMEs in developing countries that do not adopt e-procurement and other ICT solutions. The money needed for buying hardware and software, paying consultants and experts and setting up the whole system and then most importantly maintaining it over time is sometimes very high and beyond the capacity of an SME (Lee et al. , 2003). A study in the UK by Ifinedo (2011) has found that cost is a very important inhibitor as far as Smear concerned. Similarly, Mutula and Van Brakel (2007) found that cost is a critical factor for SMEs in developing countries.

### **2.9.8 Organisational Size**

Bharati and Chaudhury (2006) found that organisation size is very significant in deciding on the adoption of e-procurement and other ICT solutions. They also found that in the US (a developed country), firms of all sizes had adopted basic and simple ICT solutions, but more advanced and complex ICT solutions were only adopted by large and bigger firms with better financial and human resources. Technologies such as Accounting and web packages were adopted by almost all of the firms, but other technologies such as CRM (Customer Relation Management) and SCM (Supply Chain Management) were only adopted by larger and financially more stable firms. Karakaya and Shea(2008) also understand that better logistic and financial resources encourage larger firms to adopt new technologies.

## **2.10 Perceived Benefits**

The extents to which an organisation realises and understands the benefit of e-procurement have a greater impact on its adoption of the system. If there is lack of knowledge on the part of owners and managers regarding the benefits and use of e-procurement technology, it will be difficult to adopt it. Many researchers have highlighted the benefits of e-procurement such as Ronchi (2010) and Panayiotou et al (2004) have stated that e-procurement is instrumental in providing real time information for the business, supply chain integration, strengthening relationship with suppliers, efficient order fulfilment and tracking, good price, better service and delivery, reduction in inventory cost and reduced order cycle. As a human nature we are only willing to invest in a thing that we are of its benefits, so until there is a lack of awareness of the benefits of e-procurement, SMEs owners won't invest in it. Panayiotou et al (2004) in his research on government firms in Greece state that, e-procurement adoption has both tangible as well as intangible benefits. Tangible benefits according to him can be easily measured and quantified and most owners basically look to and influenced by such benefits, however he noted that intangible benefits can be equally or more important for the growth and productivity of the business but they are hard to be assessed and quantified in advance e.g. improved customer satisfaction, better supplier integration, improved relationship with other firms. These intangible benefits lead to tangible benefits in the long terms and have positive impact on the organisation. Ronchi et al (2010) in his research found many benefits of e-procurement and categorised it into financial and organisational benefits. Organisational benefits according to him are related to the quality of work in the organisation while a financial benefit leads to increased profit and revenue. These tangible and intangible benefits are discussed in detail in the following paragraphs.

### **2.10.1 Cost and Time savings**

E-procurement literature has discussed and revealed its value in reducing total purchasing cost for the business. As per Croom (2007) and Mishra et al (2013), reduction in cost can be felt everywhere in the business process from product acquisition to payment. However Kameshwaren et al (2007) have noted that these benefits depend on the design of the system and its appropriateness for the business because each business has varied priorities and processes. Lancioi et al (2000) and Ng (2003) have stated that an organisation must clearly state its preferences and priorities to be integrated into the design process so it can get maximum benefit from e-procurement adoption. Ng (2003) in his research measured the efficiency of the business before and after the adoption of e-procurement and found substantial efficiency in its process and reduction in overall cost. Whetaley (2003) and Quale (2005) have also found and monitored reduction in cost and improvement in business overall efficiency in their research, however they have noted that it is always not the case especially in a hostile less competitive environment. Narayanasamy et al (2008) has proved with empirical evidence that Adoption e-procurement improves time efficiency and reduces cost. However both Narayanasamy et al (2008) and Gunasekaran and Ngai et al (2009) have noted that the initial cost of implementation is so high that these benefits can only be realised in the long run. They both noted that SMEs owners and management mostly look at the tangible benefits but intangible benefits can be even more important. Some of the key intangible benefits investigated by them are as follows:

- Simpler ordering
- Reduced influence of bureaucracy
- Less paperwork
- Better consistency and minimum duplication
- Standardisation of processes and more clarity and transparency
- Online reporting facility
- Easy and efficient access to data and information
- Extended supplier pool
- Efficient communication with partners and suppliers
- Decentralised procurement process

- better compliance with limited errors
- Any time purchase of products

### **2.10.2 Improvements in Organisational Operations and processes**

As mentioned earlier as a human nature businesses and owners mostly interpret systems in term of their tangible benefits, however as per Ronchi et al (2010), in modern days business contest Quality of product, service, customer satisfaction and order fulfilment is considered far more important and leads to tangible dividends in the long run. According to Panayiotou (2004), since Quality can't be measured in financial terms, business owners sometime ignore it due to their lack of knowledge and skills. However both Ronchi et al (2010) and Panayiotou(2004), have described intangible benefits in generalised terms.

In the following paragraphs the researcher presents a detailed account of the intangible benefits discussed in wider e-procurement literature.

From the research work of Gunasekaran and Ngai et al (2009) in southeast cost of USA and Narayanasamy et al (2008) in Malaysia, it is evident allowing the business to work out of normal hours (24/7 most of the time) and better utilisation of human resources are key intangible benefits of e-procurement adoption.

### **2.10.3 Market Relationship**

Market relationship is very important for the success of modern day's businesses. Due to higher competition customer are difficult to stay loyal with an organisation unless they are fully satisfied and engaged. Similarly a stronger bond with suppliers is very important to keep them committed so that organisation is supplied with product in due time to keep the customer satisfied. E-procurement has the potential to keep both in the loop via a transparent communication and keeping track of every step in the acquisition and purchase of product and services. Narayanasamey et al (2008) have found that e-procurement provide access to a larger pool of data and information which makes the selection and purchase of product easy for them and also help in brand image building via marketing and

advertisements. Gunasekaran and Ngai et al (2009) have found that e-procurement help in increasing customer base and potential suppliers and help in strengthening bond with them.

#### **2.10.4 Significance of e-procurement Benefits for SMEs**

From the aforementioned benefits it is evident that they are equally significant for SMEs in spite of their limited human and financial resources provided that the system is designed as per the needs of the SME and the management is willing to take the SMEs forward in terms of growth and revenue. The significance is evident from the research of both Narayansamy et al (2008) and Gunasekaran et al (2009).

#### **2.11 Perceived Barriers of e-procurement**

SMEs have many barriers when it comes to the adoption of innovative technology such as e-procurement e.g. lack of technical knowledge and skills, lack of financial resources (Capital). Similarly there is a great resistance to change in the existence pattern of work by the employees as well as lack of cooperation from the top management which in case of SMEs are mostly the owners of the organisation.

Generally Hawking et al (2004) has identified the following barriers to the adoption of e-procurement.

- Cost and nature of technology
- Lack of business relationship with suppliers
- Lack of technologically skilled people
- Legal infrastructure and lack of legislation
- Not having standard data exchange procedures
- Security of transactions
- Political issues
- Competition from other firms
- Trust Issues
- Cultural Difference



Similarly Liao et al (2003) has mentioned a few behavioural and infrastructural barriers that effect the adoption of e-procurement e.g. favouritism from supplier from some purchasing organisations, false floor prices and information leaks while in terms of technological barriers he mentioned the lack of technical human resources and general infrastructure required from the smooth implementation of e-procurement in an organisation.

Following are some of the key categories of barriers discussed widely in e-business and e-procurement literature

### **2.11.1 Technological barriers**

Technological barriers include the lack of technical brain to maintain and run the e-procurement system in the organisation as well as the pre-requisite technical infrastructure and standards needed to run the system e.g. computers, fast internet connection and network etc (Toth, 2015). The vendors mostly install the software and provide training to the workforce but if the workforce lacks the basic understanding, technology will not work (vaniea et al, 2012). In such cases the organisation is required to hire external skilled people to smoothly run the software and train the people until they use to it and are able to run it efficiently and if the vendor does not provide such assistance, the organisation will find it extremely hard to adopt technology. Stockdale and standing have noted that sometime the vendor's charges for training are higher than the software itself and beyond the capacity of the SME and they are thus unable to adopt the innovative technology. They also noted that such vendors mostly target bigger companies because they can afford more money and have technical and infrastructural capacity to easily adopt the system easily and smoothly. Ongori and Migirio (2010) and Tan et al (2009) have found that lack of security standards in the software is another key reason why SME owners show resistance to the adoption of e-procurement.

### **2.11.2 Legislation, Infrastructure, Management, Lack of Knowledge and skills**

Adoption of e-procurement require specific laws and regulations to avoid and solve various conflicts between various stakeholders but as per Ongori and Migrio (2010) and Karjalainen and Kempainen (2008), lack of such laws and legislations in developing and underdeveloped countries exhibit a barrier to the adoption of e-procurement adoption. For example in some developing countries tendering laws require the parties to produce written documents for a bid which can be big hindrance to e-tendering which is the core element of e-procurement. Similarly telephone lines, cabling, postal system and e-payments etc are some key infrastructures that are not in the hands of the organisation but are in the hand of the government and unless such infrastructure is not available, e-procurement adoption can just be a mere dream (Karjalainen and Kempainen, 2008).Also it is vital that the suppliers have either adopted or have the willingness and ability to adopt the technological standards required for the smooth running of the intended e-procurement system by the firm. Lack in any of these areas will create hindrance to the adoption of e-procurement by the firm.

The role of management is vital for the adoption of e-procurement. If they are not willing or unaware of the benefits offered by e-procurement for the organisation, the adoption can be very difficult. Similarly larger firms size in terms of capital, revenue and number of employees, types of trading it is involved in, whether involved in international trade or not, association or partnership with larger firms are some key characteristics that can determine the successful adoption of e-procurement. Companies' policies, managerial skills, decision maker's willingness and attitude, supply chain integration are other key features that effect the adoption of e-procurement (Johnson, 2010; Zheng et al., 2004).Lack of technical knowledge and skills of the human resources within the organisation is a key hindrance to the adoption of e-procurement. It will not only create problems in the running of the system but also act as a source of resistance to the adoption of the system because they will feel insecure and might even lose their job due to deficiency in skills (Mehrtes et al, 2001). Similarly Mehrtes et al (2001) further noted that SMEs with limited financial resources will find it difficult to hire skilled and knowledgeable individuals due t their demands of higher pay and also their scarcity and greater demand in the market.

## 2.12 Critical Success Factors

Critical success factors are those factors that are considered essential for a successful E-procurement adoption in SMEs. Due to low capital, SMEs are sometimes reluctant to use new technology and methodologies or cannot afford them. However, in spite of low capital, SMEs are still considered innovative and flexible. Taking into account the low capital and small size of SMEs, tactical operational procedures, appropriate strategies and plans need to be developed in order to achieve smooth and successful e-procurement adoption. The nature of the services and products offered by the organisation, its business scope, its role in the supply chain, product mix, the volume of its business in the industry and its role and influence in the service and product industry, along with other critical success factors, need to be analysed before adopting e-procurement. Some of the critical success factors are mentioned by Fu et al. (2004), and include promotional incentives, top management commitment, feasibility in terms of money and resources, government support, stepwise transformation and maintenance as well as other operational procedures. Reddick (2004) also highlighted some key success factors in his successful e-government growth model, including IT capability of the organisation and competent and knowledgeable management that know the pros and cons of e-procurement. Tas and Genis-Gruber (2008) believe that culture is another key determinant of e-procurement adoption. The role of culture will be very significant in Saudi Arabian SMEs.

Some of the main areas of e-business where researchers have investigated the impact of critical success factors are ERP, E-procurement-commerce and E-management. One of the very important aspects highlighted by Croom et al. (2007) is the internal service quality. Rahim (2008) found that risk of control, security and existing infrastructure are some of the key factors in developing countries holding organisations back from adopting e-procurement. They also found that on top of these factors, managerial commitment is considered the most important. Vaidyanathan and Devaraj (2008) found that there is a strong relationship between logistics processes quality, IS process quality and quality of e-procurement process success. They also found that order timeline and processing quality has a much greater impact on supply management accuracy. Reddick (2004) found a positive relationship between e-procurement and the efficiency and quality of management

ability. They found that a committed and well performing management is a key element or catalyst for e-procurement adoption. Numerous studies on the subject have found that quicker adoption of e-procurement needs to address legal, political and structural factors that are specific to the administrative and political needs of the organisation. Similarly, Carayannis and Popescu (2005), Henriksen and Mahnke (2005) and Panda and Sahu (2012) found that political will, vision and commitment of management is required for successful adoption of e-procurement. Vaidya et al. (2006),

### **2.12.1 E-Procurement Implementation Strategy**

A comprehensive and well planned implementation strategy is critical for the successful adoption of e-procurement: therefore, management will need to conduct thorough analysis and brainstorming after they decide to implement the process so that the opportunities and perceived benefits can be successfully achieved (Presutti, 2003). The organisation must take into account the perceived benefits, objectives and opportunities it wants to avail from e-procurement adoption. A major benefit to the firm from e-procurement adoption will be the internal collaboration and integration of various departments in addition to optimization of cost and leveraging the buying power of different suppliers available in the market. One major hurdle that a successful strategy must take into account is the aggregation of demands because different departments will not want to lose their authority and will resist such a change. Therefore, effort will be required to persuade them and achieve the goal. However, it is also imperative that the degree of decentralisation is properly weighted because sometimes it has an adverse effect on the business (Neef, 2001).

### **2.12.2 Project Management and Business Case**

Careful initiation steps are required in order for the firm to make gradual progress towards the adoption of e-procurement (Lefebvre et al., 2005). A strong and detailed case must be made and presented to the management and other stakeholders so that they can be persuaded and convinced to implement the process. A strong case will be one that can argue and present benefits of the system in relation to the cost that might be incurred and also highlight the drivers that can help the organisation to achieve the goal of e-procurement adoption efficiently. One such way will be to undertake a pilot project and

show the documented findings and results to the management and other stakeholders so that fears of e-procurement adoption can be mitigated (Smith, 2009). The case must also contain the mitigation plan to avoid or otherwise eradicate the affects of such risks or any temporary setback in the adoption of e-procurement.

### **2.12.3 Business Process Re-engineering**

The current or existing business process must be re-engineered in such a way that inefficient system flow and unmanageable processing can be avoided (Lee et al., 2011). The management and business will therefore need to have fresh look at all the processes and functions that were previously being carried out so that they fit the new demands of the process. Processes that are inefficient and not yielding the desired results must be washed out, while those that are valuable must be kept and taken along with new and efficient replacement processes. Many businesses in India, Malaysia and other developing countries have benefited greatly from process re-engineering in e-procurement adoption (Pohl, 2010).

### **2.12.4 Technological Standards**

Since e-procurement will have a great impact on the enterprise as it undergoes horizontal as well as vertical integration to achieve the full benefits, it is very important to adopt well-accepted and proven techniques, procedures and processes so that the desired objectives can be efficiently met (Ghimire, 2013). Also, it must be ensured that the system meets the relevant legal requirements of the country and business market: otherwise there will be legal and administrative problems that might lead to system failure. The cost of technology can be easily minimised because many open source technological standards are available nowadays (Liu, 2011). A proper system manual to run and optimise the system and also balance the load on different servers and backup servers, along with system recovery in case of failure, must be properly planned and implemented. Similarly, while designing the e-procurement system, it must be ensured that the design is user-friendly and simple to use. The navigation between various subsystems must be easy and efficient too. The system must be designed in such a way that minimal mouse clicks and efforts are required to get the information one needs (Arts, 2012). The system must not be overburdened or heavy so

that it can be efficiently used over a slow internet speed. There must be a clear and structured help facility available for each part of the system in order to make it easy to use. There must also be answers to all frequently asked questions.

#### **2.12.5 Authentication and Security**

Security and authentication are key factors for the effective adoption of e-procurement because if such things are not implemented into the system, it promotes corruption and breach of reliability instead of benefits to the system (Costa, 2013). Data and information must be kept extremely secure and must be made available only to the authorised personnel. The organisation will not only need to install antivirus, firewall and spyware software but will also need to keep them updated on a regular basis. Similarly, some intrusion detection and prevention software will also need to be installed so that the system is fully protected. The system will also need to use proven and affective encryption and decryption procedures so that information and data are not compromised and obtained by other firms and people (Lee, 2013). The selection of security hardware and software is critical and the organisation must ensure that it implements the right ones in its system. In short, the system must be protected in every way so that there is integrity, confidentiality, authentication and effective availability of information and data for the users.

#### **2.12.6 System Integration**

Integration of the new e-procurement system with current technological standards being used by the firm across its various departments is imperative for the effective and successful adoption of the e-procurement process. Integration of e-procurement with the accounts, finance and information systems of the organisation is particularly important (Lee, 2013). Also, it is pivotal to success that the information being exchanged with various departments is accurate, secure and reliable and is available in real time. Similarly, access privileges and rights must be established for various user levels so that only the right and authorised personnel have access to the right sort of information (Lee, 2013).

### **2.12.7 Change Management**

Effective change management is required for the successful adoption of e-procurement because the goal is not only understanding and acceptance of the system by the firm staff and management but also by the stakeholders, i.e. suppliers and customers (Lee, 2013). Plans need to be made in terms of providing training and support to various departmental staff as well as suppliers and also for obtaining feedback and queries and working on them to bring improvements to the system. Various types of support procedures, such as contextual help, online help, and call centre or helpdesk support, might need to be established for efficient use and operation of the e-procurement system and must be integrated into its portal. The main goal is to make the change effective so that there is no need to reverse it.

### **2.12.8 Performance Measurement**

It is very important that the firm and management establish objectives and goals that the system must meet. They should devise a procedure where the performance of the e-procurement system can be regularly measured and monitored against the set objectives (Lee, 2013; Smith, 2009). The measuring procedures must be clearly spelled out so that everyone can understand the results and can work to improve them (Barasa, 2014). Such milestones and goals are not only important for the firm but will also help in encouraging the supplier to work towards improving their achievements.

### **2.12.9 Education and Training**

Transformation from a manual procurement system to e-procurement is a major jump as far as technology is concerned: therefore, education and training of firm and stakeholder's staff (suppliers) will be required (Lee, 2011). The firm must be sure to explain the system to the stakeholders and offer them training and also to provide proper help facilities to the staff to make the transition easy and successful. The designer must ensure that the interface is user-friendly, interactive and offers an environment where problems and issues faced by the users can be solved efficiently and effectively (Lee, 2011).

#### **2.12.10 Adoption by Stakeholders**

For successful e-procurement adoption, it is imperative that the most important stakeholders, i.e. the suppliers, accept it (Goswami, 2009). Also, they must be involved and taken into confidence at each step during the adoption and implementation process. They must be encouraged and convinced that the implementation is mutually beneficial for them and the firm. Feedback and consent of suppliers is very important not only for successful adoption but also for future successful running of the system. Again, simplicity simple and user friendly system interface is required if suppliers are to accept it (Kamal, 2011).

#### **2.12.11 Firm Size**

Patterson et al. (2003), while highlighting critical success factors in e-procurement for their conceptual model, stated that organization size is a key determinant. He noted that bigger firms not only have access to huge capital but are also in a better position to cope with the risk involved in investing heavily in new technologies. Similarly, larger firms are in a better position to benefit from the adoption in terms of economies of scale (Grover and Gosler, 1993). Patterson (2003) also found that firm size has a strong relationship with organisational adoption of e-procurement. Lancioni et al. (2003) conducted a detailed investigation of the factors that affect the use of the internet and IT in the purchase, supply chain decision and procurement process. They investigated twelve separate procurement applications and then conducted a survey in which data were collected from 190 Logistic Management councils. Annual sales and the number of employees were considered as the main determinants of firm size.

#### **2.12.12 Supply Chain**

One of the key factors that firms must take into account in order to achieve successful e-procurement adoption is supply chain integration. Smith and Flanegin (2004) believe that firms must understand and know that their current and potential future suppliers are capable and ready for e-procurement. They further state that those suppliers that are not ready for the process will not participate. Similarly, they argue that the potential suppliers must equipped with the resources needed by the firm, and must be able to use the firm's software and technology, which in other words means they should have the ability and



expertise to use new technology and software. Smith and Flanegin (2004) also noted that the cost of the process (technology and software) must be feasible for both suppliers and buyers: otherwise the integration process will not be possible. They also believe that in order to meet the requirements of e-procurement, both supplier and buyers need to make some adjustments, which itself will incur some cost, so both organisations must be aware of and ready for these costs and must conduct cost/benefit analysis. Many firms perceive that the cost will reduce, but it actually increases, so they must conduct an analysis of that scenario. It is also vital for the firm to decide about the responsibility for updating the database about services and products (Croom, 2005). The firm needs to think carefully about whether the update operation will itself establish the catalogue of services or products or whether they will need to use the supplier's catalogue for this process. These questions are very important for the adoption and operation of a successful e-procurement system. Both buyer and supplier must be aware that in addition to the upfront cost of adoption and integration, there are cost of maintenance, upgrades and others which they must be aware of and ready for. On-going costs include help and support, licensing fees when the current licensing period expires, security software updating, which is also very important, as hacking and other cyber attacks are very common these days, as well as maintenance costs for the system. It is also important that both buyer and supplier use the same standards for their services and product catalogue. Puschmann et al. (2005) believe that an agreed-upon or collaborative e-procurement which is accepted by both buyers and suppliers is of great benefit. Such collaboration can be made possible through web portals.

### **2.12.13 IT competence**

Staff equipped with better skills and IT competence constitutes an important and core asset for organisational adoption of e-procurement. Managerial competence and IT knowledge at enterprise level is especially important and significant for successful e-procurement adoption (Aguar et al., 2008). The key managerial skills needed by a successful organisation include leadership, business deployment, external networks, process adoption, IT infrastructure, data utility and IT planning. However, IT resources and skills are considered the most significant and serve as a key determinant of e-procurement adoption. This study considers IT competencies and organisational setup as key determinants of e-procurement adoption.

## **2.13 Perceived Future Organisational Performance**

E-procurement has been recognised as a very effective tool that is perceived to improve performance in terms of streamlining performance and reducing cost.

It has also been noted that centralisation in the procurement process is highly beneficial and has a positive impact on the efficiency of procurement process Van and Weele (2005). The potential adverse effects of e-procurement can be greatly reduced by the centralisation of the e-procurement process. E-procurement allows smaller firms to come into line with larger firms and to learn and be encouraged by their experiences and expose themselves to bigger competition where they can learn new things. Attaran, (2001), understand that the low transaction and infrastructural cost of electronic or internet-based systems give organisations an opportunity to exploit exchange of information with many partners in addition to trading gains from them via a closer and more effective relationship. Wamba et al. (2008) found that e-procurement strengthens the trading relationship between different partners, which leads to a source of competitive advantage for both the partners: i.e. buyer and seller. Close relationships between various trade partners lead to better performance and are also beneficial for all supply chain partners (Wamba et al. 2008). Salkute (2013), believe that many companies without operational logistical competencies can still benefit from partner firms' logistical competencies and experiences. Liker and Choi(2004) state that electronic relationships between various trading firms enable them to learn from each other, thereby improving product and service quality, reducing cost and giving rise to innovative ideas along with faster arrival of products from the supplier. Johnson (2011) found that EDI (electronic data interchange) with favourite buyers allow real-time signing of agreements with preferred prices, which is fast and efficient. Parida et al,( 2010), understand that the most effective and efficient e-procurement systems require that vendors or suppliers participate and are consulted during the design of such systems. This will allow firms to have multiple choices of design, from which they can select the one that best suits their business. It will enable many partners (buyers and sellers) to work in partnership to learn innovative ideas, improve on product quality and reduce service and production costs (Christpher and Gattorna 2005). Such relationships between different

business partners lead to organisational learning, which helps in reducing redundant cost and improving the speed of service, quality and reliability and trust (Selnes and Sallis, 2003).

From this literature research, it is evident that firms and their partners' performance improve with the adoption of e-procurement and other e-business tools. Similarly, the research also demonstrates that the greater the number of partners in a supply chain, the better the chances of improved performance.

### **2.13.1 Improve performance in terms streamlining processing**

Procurement-related processes are vital for the effective conduct and operations of any organisation. Every organisation requires tamper-free, accessible, accurate, reliable and original memory for vital strategic decision-making. Transparency, documentation and record-keeping in e-procurement not only increase transactional and processing time but also help in reducing financial loss and legal vulnerabilities. David (2005) states that, e-procurement is inevitable in the current business era due to complex and challenging customer demands and growing competition. He further states that e-procurement positively contributes to procurement performance via streamlining processing. E-procurement systems are vital and provide documentary evidence that confirms the needs of an organisation and helps with the effective management of the products to create satisfied customers and increasing business efficiency. Bolton (2006) has stated that e-procurement systems allow SMEs and other firms to securely access and track as well as store vital business information and documents and help management to make business decisions efficiently and effectively.

### **2.13.2 Information sharing in e-procurement**

Information sharing refers to the phenomenon of time-efficient information flow and making such information available whenever required in an open and transparent manner (Eng, 2004). Eng (2004) further states that such sharing of information is bound to have a positive effect on the performance of any organisation (seller or buyer). For example, E-marketplace is an electronic technique which co-ordinates and controls business activities across different firms and reduces the cost of business transactions in addition to improving information flow and reducing uncertainty (Eng, 2004). Evan and Wruster (2001) have

noted that the use of information technology leads to wide distribution of information and knowledge and allows firms to access a wide pool of suppliers from which they can choose the most suitable one. Such flexibility is not available in other procurement techniques. Malone et al. (1987) also believe that electronic sharing of data and communication is an effective way to reduce the cost of transactions and to coordinate transaction and production via supply chain management. Barratt and Rosdahl (2002) have found that e-procurement leads to transparency and ease of searching for buyers. They noted such reduction of cost in three different dimensions while investigating supply chain management in the e-marketplace i.e. increasing organisational efficiency, reduction per unit cost and streamlining business operations. Croom and Johnson (2003) also investigated supply chain performance and found that e-procurement leads to better internal performance, reduction in cost and process conformance.

E-procurement can provide strategic, operational and tactical advantages for the organisation in the future (Attaran, 2001). However, the belief of top management decides the extent to which the process will positively influence the performance of the organisation. Top management knowledge and understanding of the process in depth and the financial, technological and human resource costs involved in the process is a prerequisite for both the short- and long-term benefits that the organisation can obtain from the adoption of the process. Similarly, they need to know the impact of the process on the organisation's relationships with both suppliers and buyers. Historically, management and owners of SMEs are mostly focused on short-term and not long-term goals, which is not desirable in this case. They must be aware of the changes in the business environment around the globe, the use of new technology, especially the internet, and the concept of virtual supply chains, resource planning and supply chain management. The focus should not only be on financial gains, as there are non-financial aspects of the business that are equally important.

Wamba et al. (2008) found that electronic product codes and radio frequency identification technology had a positive impact on organisations' return on investment, inventory turnover and overall cost and quality.

### **2.13.3 Short- and Long-term organisational performance**

According to Gunasekaran and Ngai (2009), the extent to which the owner and top management believe that e-procurement will have an impact on the future short- and long-term performance of an organisation play a vital role in e-procurement adoption. Humphrey et al. (2004) stated that e-procurement advantages are both short- and long-term, but initial implementers will realise true benefits in the long term due to the huge initial cost, but later in the course of the business, the benefits can be realised in the short term. Humphrey et al. (2004) further state that e-procurement adoption is a win-win situation for both SMEs and their suppliers, as both gain benefits in the short and the long term. Wamba et al. (2008) stated that e-procurement potentially improves organisations' performance and yields long- and short-term performance benefits in areas such as cost reduction, strengthening relationships with suppliers and improving organisations' competitiveness and customer satisfaction.

### **2.13.4 Improve cost performance in organisation**

E-procurement improves inter-organisational cooperation and co-ordination, thereby reducing transactional cost and competitiveness via enhanced sourcing opportunities (Subramaniam, 2002). In the era of demand-side economics, e-procurement can help in easing complex and challenging co-ordination. Modern business challenges require visible and more vibrant human interaction within as well as outside the organisation with partners and stakeholders. Croom and Johnson (2005) have stated that e-procurement provides support to managers in budgetary control, enhancing transparency, and also provides robust process performance. It extends transparency to external stakeholders and improves reliability of management information systems. Christopher and Gattorna (2005) have stated that e-procurement allows businesses to set up price competing strategies, which substantially decreases the overall purchasing cost. The two main areas of cost for business are transactional cost and the cost of purchasing, and both can be decreased by e-procurement adoption (Kopczak and Johnson, 2003).

### **2.13.5 Organisational competitiveness**

E-procurement is instrumental in providing co-ordination amongst various departments to ensure that products of the right quality can be obtained at the right time from the right source and thus customer satisfaction can be achieved. Croom and Johnson (2005) have also found that internal customer satisfaction can be enhanced with e-procurement adoption, which is central to the business efficiency of an organisation. Fiala (2005) has stated that e-procurement has the ability to integrate different procurement activities with suppliers and partners, which is a key pre-condition for enhanced quality of procured products and response to market changes. Closer integration and co-ordination with various departments, suppliers and business partners allows firms to predict marketing trends and also guarantees the procurement of the right quality material at the right time to achieve competitiveness and customer satisfaction (Wu et al., 2006).

### **2.13.6 Organisations' revenue increase**

One of the key factors that SMEs want from e-procurement adoption is an increase in revenue, either via increasing its market share or reducing cost (Parida et al 2010). Salkute (2013) has stated that some of the main benefits that SMEs want to gain from e-procurement adoption include increase in transactions and revenue generation. Salkute (2013) understands that e-procurement adoption leads to firm savings via increasing business transactions, bringing transparency in business and standardising various processes. These standardisation and cost saving activities ultimately lead to an increase in organisation revenue.

## **2.14 Cultural aspects, E-procurement adoption and theoretical formwork**

### **2.14.1 Introduction**

Adoption of any innovative technology, including e-procurement, is a result of a number of individual decisions (GamalAboelimged, 2010). Values and attitudes intervene and mediate the needs from daily life experiences, and technology is used to fulfil those needs (Belanche et al., 2012). Innovations are based on ideas and it is the people who carry, react, develop and modify those ideas (Yousafzai et al., 2007). The attitude and values of an individual and the response expected from a wider group play a key role in the diffusion of innovation process. It is only natural that individual and team needs will vary, as will the overall behaviour of an organisation in any specific national culture. Nevertheless, people who work and live in a particular cultural environment will develop certain norms, attitudes, values and practices, which are a shared source of interaction and socialisation in an organisational setup and have an impact on the adoption of technology.

In the following paragraphs, the author discusses the impact of culture on the adoption of technology. First of all, a rationale for the role of culture on ICT adoption is presented, followed by a brief account of Saudi national culture. Further, the culture of Saudi Arabian SMEs is discussed and related to the model elements, followed by a comparison of the Saudi Arabian culture and SMEs' culture to evaluate the efficacy of cultural aspect of the model elements. Finally, the negative and positive aspects of Saudi socio-cultural aspects are evaluated to get an insight into the favourable and non-favourable aspects of culture for the adoption of technology (e-procurement).

### **2.14.2 Rationale for the cultural influence in ICT (E-procurement adoption)**

Culture is one of the key and important determinants of human behaviour (Robins et al., 2013). However, in spite of its importance, cultural aspects of technological acceptance have not been given the attention they deserve (Winner, 2010). Bertot et al. (2010) found that acceptance of technological innovation depict the socio-cultural needs of a country and the culture of the firm (SME etc.). Many researchers, including Bertot et al. (2010), Schepers and Wetzels(2007) and Straub (2009), believe that technological acceptance and use differs across cultures. Vance et al. (2008) have stated that incompatibility with cultural values,

practices and traditions can lead to rejection of technology. Differences in the usage pattern and time required for acceptance are key cultural factors for the acceptance of technology (Venkatesh et al., 2012). Vance et al. (2008) have found that Arab culture gives preference to face-to-face bargaining and communication as opposed to the use of technological means. Li and Kirkup(2007) have stated that ICT applications have been spreading across all types of cultures; however, the acceptance of many ICT applications, especially those related to communication, is based on cultural beliefs and values. Since online communication changes the way information is shared, a culture might encourage or discourage this phenomenon over the internet (Li and Kirkup, 2007) From Al-Gahtani et al. (2007), it can be asserted that in Saudi cultures with high uncertainty avoidance, culture has a major role in scrutinising the acceptance of technology. Being a collectivist society, Saudi businesses and individuals imitate others' adoption of technology.

Based on the evaluation of Hofstede's cultural model by the above researchers, it can be stated that Saudi culture is not very conducive for the acceptance of technology and innovation. There are more than one reason but one key reason found by AL-AULAMIE (2013) is gender differences in a culture influences the adoption of innovation and Saudi Arabia is male dominant culture. However, things are changing with the improvement in infrastructure, ICT education and globalisation, although it is still far behind the USA and other western countries.

### **2.14.3 Saudi national culture**

Saudi culture is an amalgam of Arabic and Islamic beliefs and traditions that acknowledges tribalism and prestige and maintains hierarchy and conservative characteristics (Baghdadi, 2013). The conservative nature of Saudi society affects all aspects of life. Saudis are greatly attached and show love for their heritage, which influences the way they live, work and do business (Dwived et al., 2007). Baker et al. (2011) has stated that these cultural traits impose negative as well as positive impacts on individuals and businesses in Saudi Arabia. The Saudi Government is well aware of these cultural obstacles and has done a lot to improve the nation's infrastructure and educate people with a hope to increase awareness and allow people and businesses to take advantage of technological innovations. E-procurement and other technological innovations are crucial because they will bring about



changes in the way firms operate, interact with customers and suppliers and carry out business. From Baker et al. (2011) and Nadi (2010), it can be asserted that one of the key advantages and changes in business culture that will be imposed by e-procurement is the eradication of nepotism and other unfair means, where some people and businesses are treated differently based on personal relationships, connections, kinship and other unfair practices which are some of the features of the society and culture at the moment. National or societal culture affects the way individuals react to the adoption of innovative technologies such as e-procurement. As discussed by Heals et al. and Lee et al. (2007), societal culture has an influence on the culture of an organisation.

#### **2.14.4 Organisation culture of Saudi Arabia SMEs**

Organisation culture can be defined as

*“The values, attitudes, beliefs and behaviours that represent an organisation are working environment, organisational objective and vision”*(Hofstede, 1984).

As discussed by Schwartz and Davis (1981) and Schein (1992), culture is made up of the values, beliefs, practices, assumptions and artefacts that members of an organisation share. An organisational culture is socially built, holistic and traditionally decided (Svendsen et al., 2013). According to Cummings and Worley(2014), culture is made up of values, beliefs and behaviours that exist at various levels in an organisational hierarchy and is apparent via a wider range of salient characteristics of the organisational life. Hofstede (2001) has stated that organisational culture is a combination of shared values and beliefs, practices and assumptions over a period of time and shapes the behaviour and attitudes of individuals in an organisation. Anthropologists have been studying and analysing societal culture for decades; however, the study of organisational culture is not less well established and only became apparent in the late 1970s (Sardar, 2015).

According to Hofstede (2001), organisational culture is related to organisational practices, while societal culture is related to attitudes, beliefs and behaviours rather than practices. Values are individuals' preferences to accept and support one situation over another and are very hard to change. Practices, on the other hand, are external and not very deeply rooted and can be changed (Hofstede, 2011).

Al-Gahtani (2007), in his research on Saudi Arabian organisations, found that various characteristics of the organisation's culture, such as gender, level of education and age, affect how ICT innovations are perceived and adopted. Furthermore, he affirmed that private sector organisations are comparatively more enthusiastic about the adoption of innovations.

According to Baker et al. (2011), the majority of SMEs' owners or leaders are not technology literate and follow basic business models due to the conservative nature of the society in general and its high uncertainty avoidance. One of the key reasons, as stated by Eid et al. (2011), is the corporate structure of Saudi firms. The majority of the SMEs belong to a single owner or family and are managed by the owner, who takes all decisions. The owner mostly inherits the business and is not appointed on the basis of their qualifications and skills, and thus cannot always take strategic decisions. Another key issue stated by Al-Somali et al. (2013) relates to the existence and use of websites in these SMEs. The owner takes all decisions and mostly appoints family members and relatives who do not have the required credentials to implement innovation in the firms. Nepotism is one of the key obstacles in implementing innovation and the adoption of technology. As discussed by Al-Somali (2013), nepotism (*Al-Wasta*) and inheritance are the key cultural factors that advocate the status quo and pose great obstacles for the adoption of innovative technology in SMEs. Since managers are appointed on the basis of inheritance, personal relationships and connection, they do not seem to enhance firms' benefits.

#### **2.14.5 Cultural Integration and Success Stories**

In spite of all these cultural inhibitors, there have still been some success stories in the country, such as eXtra (United Electronics Company), which for the first time launched e-commerce in twenty-three cities in Saudi Arabia and offers home delivery. Another company that has successfully started e-business in Saudi Arabia is IKEA (Al-shehri and Dew, 2010)

Unlike eXtra, IKEA was a foreign company and had little awareness of Saudi culture but it quickly realised this and made some key decisions, which paid off. It chose a well-known local businessman (Ghassan Ahmed Al Sulaiman) as its franchise owner, which helped in

increasing people's trust. The company also made the following modifications to adapt to the social and cultural norms of the country:

- It modified its uniform to fit into Saudi cultural values;
- Changed its products catalogue to more conservative products as compared to those offered in western IKEA stores;
- Changed its shopping mode to partial self-service as compare to full service elsewhere;
- IKEA celebrates local festivals and not Swedish and western festivals;
- Gender separation and removal of alcohol from its restaurant menu;
- Removed religious symbols and named products in two languages (English and Arabic);
- No women appeared in its catalogue.

These changes brought great success for IKEA in Saudi Arabia, which is proof that culture has great impact on the way business is conducted.

#### **2.14.6 Comparison between Saudi and US SMEs' Culture**

Internet penetration around the globe has brought revolutionary changes in the way businesses operate and consumers recognise their needs, search and buy products under the umbrella of e-business. According to Al-Somali (2013), global e-commerce is worth over \$10 trillion (US Dollars) in the global economy. The internet is a good platform for businesses and provides them with equal opportunities to increase productivity, reduce costs, improve customer service and extend their customer base beyond geographical boundaries. However, not every customer in the world has access to the internet or prefers to buy online (some have trust and other issues). The US has the highest level of e-commerce, accounting for more than 70% of electronic sales (Sila, 2013). In the US, businesses and consumers indulge in online buying and selling without any fear, but this is not the case in many other parts of the world: for example, the total online sales of the entire Middle East and Asia are around 3% of the world's online sales (AL-Ghamidi, 2012). However, forecasts indicate that the Arab countries are rapidly improving on e-sales due to

improved infrastructure, and this is particularly the case for Saudi Arabia (the most successful economy in the Middle East) (Al-Somali et al., 2013). E-learning and e-government are presently the most popular e-applications in Saudi Arabia but other e-business applications are gaining in popularity, and according to Al-Shehri and Dew (2010), Saudi Arabia had an online revenue of \$520 million in 2011-12. According to a survey by PayPal (a global online transaction service provider), more than 40% of the Middle Eastern population are hesitant and perceive security risks in online shopping and payment (Van-Slyke et al., 2010).

Unlike Saudi Arabia, US businesses (including SMEs) and customers are more comfortable with online shopping and do not see any security risks because they have experience in online transactions. Alternative to online payment cheque or cash on delivery as happens in some Asian country (e.g. India) can be a solution where businesses and suppliers can pay once the item is delivered but cheque payments takes time and if there is a return it will take even more time to get a cheque back. Businesses normally do not pay in cash because it doesn't have any evidence (Anupama, 2016). Also if customer doesn't like the products they will return it back and the company has to bear the reshipping charges. Even a bigger problem is fraud orders because the business dealing in cash on delivery have minimal or no proofs unless the customer have a previous purchase history (Anupama, 2016).

#### **2.14.7 Cross-Cultural Perspectives**

According to Hofstede (2010), Saudi and US cultures vary on many of the dimensions of his model. While Saudi Arabia is a collectivist society, the US is on the other end of the spectrum, as an individualistic society. Countries lower on individualistic scores, such as Saudi Arabia; accept technological and other innovative changes by looking at others: i.e. they follow others' footprints. Further, the environment in a country also influences individuals' and businesses' perceptions about electronic commerce: for example, US consumers have positive perceptions about online shopping and do not perceive any significant risk in it (Lee et al., 2013), but this is not the case in Saudi Arabia, which is a collectivist society and an environment where online commerce doesn't have trends.

Further, on the factor of UA (Uncertainty Avoidance) Saudi Arabia has a higher score than the USA and is thus unwilling to take any risks in accepting the innovative technological changes on an individual as well as a business level (especially in SMEs where the sole owner has to take the decision). Similarly, on the dimension of Power Distance (i.e. the gap between rich and poor), Saudi Arabia is much higher as compared to the US, which is another reason for its reduced acceptance of changes, because in such societies, people look to their leaders to guide them (Idris, 2007).

Based on Hofstede's cultural dimensions and previous studies, one can easily deduce that there are substantial differences in Saudi and US culture, which explain why in spite of all the advancement and improvements in infrastructure, individuals and small businesses in Saudi Arabia are not yet willing to adopt technological changes to the extent that we would expect in a developing economy. Particularly the risk in online payment and the lack of appropriate security measures and regulations, together with relative lack of awareness, keeps Saudi Arabian Consumers and businesses behind the rest of the world.

#### **2.14.8 Impact of Culture on ICT Adoption (e.g. E-procurement)**

The influence of culture on ICT adoption has been discussed a lot in the literature by many researchers and scholars. They have established that various cultural characteristics such as Gender, language and religion etc effects ICT and innovation adoption in an organisation e.g. Leinder and Kayworth (2006) has mentioned that one of the main reason in organisations adoption of innovation is Culture. This literally means that the way in which individuals of an organisation experience the use of information system decides the success of its overall adoption success in that organisation. This shows that understanding of culture is key the adoption success of an ICT innovation in an organisation. Seng et al (2010) has stated that since all organisations in all parts of the world wants to adopt ICT innovation, require that the culture must be studied and its possible impacts must be clearly understood before the adoption, so as either to mitigate those culture impacts or integrate it into the proposed solution. This means that IT diffusion in an SME require detailed and complex understanding of the social, cultural and behavioural forces of that SME. Seng et al (2010) further stated that since IT is diffusing in all types of organisations and at all levels nowadays, so it is fundamental to understand the culture and behavioural aspects so as to

provide a positive environment and overcome the cultural obstacles that might hinder the adoption. Similarly Leinder and Kayworth (2006) and Straub et al (2002) has also emphasized on the importance of understanding cultural characteristics and have established links between culture and Information system adoption.

Some of the key culture traits and their importance to the adoption of IT innovation in small and medium size firms, discussed in the literature have been tabulated as follows with literature links.

<b>Key factors identified in literature related to the Culture affect how ICT innovations</b>	<b>Literature Links</b>
gender	Al-somali(2016), AL-AULAMIE (2013) Al-Gahtani (2007), Hofstede et al., 2010)
Education level	Baker et al. (2011), Al-Gahtani (2007),, Nadi (2010), Hofstede et al., 2010), Hofstede (2001)
age	Al-Gahtani (2007), Hofstede et al., 2010)
Language	Hofstede et al., 2010), Al-Gahtani (2007), (Baghdadi, 2013).
Religion	Hofstede et al., 2010) (Baghdadi, 2013). Schwartz and Davis (1981) and Schein (1992), Straub et al. (2009) ,Van-Slyke (2010) , Abu-Mosa(2008), Al-Meer (1993)
Social life	Hofstede et al., 2010), Cardon and Marshal, 2008). (Erumban et al., 2006). (Abu-Mosa, 2008), (Baghdadi, 2013). (Idris, 2007).
Alwastah(napacism)	(Baghdadi, 2013). Al-Somali (2013),
Family based SMEs	Eid et al. (2011), Al-Somali et al. (2013) Baker et al. (2011)
norms, beliefs and values	(Straub et al., 2002; Leidner and Kayworth, 2006). (Srite and Karahanna, 2006), (Al-Maliki,2014), Li and Kirkup(2007), Vance et al. (2008), Vance et al. (2008)

**Key cultural factors in e-procurement adoption**

#### **2.14.9 Key findings from the literature**

From detailed investigation of Saudi culture the author has found that gender Education level, age, Language, Religion, Social life, Alwastah (nepotism), Family based SMEs, norms and beliefs & values are key perceived traits that affect the adoption of e-procurement. The importance of gender as is stated by Al-somali (2013) and Al-aulami (2013) is also evident from Hofstede (2013) culture dimension of masculinity score, which shows that country is male dominant. The factor is also related to that fact the country has strict Sunni Sharia law as is mentioned by Beghdadi (2013) and many others, which imposes several restrictions on women participation in business and some other social and political activities. Further the country education level particularly IT education is low as compared to developed countries in spite of government recent spending on education (Al-Gahtani, 2007). Other key factors such as collectivism as the hall mark of the country's social life as shown in Hofstede (2010) cultural dimensions and from the studies of Beghdadi (2013) and others as shown in the table 1. Age is also a key factor as almost half of the country population is around the age of 25, which is an encouraging sign because as can be seen from the Arab spring, they are aggressive and want reform in the society. Other key tribal norms and traditions coupled with Sunni Islamic form of conservative Islam impacts all aspects of life i.e. business innovation and everything as can be seen from the research of Straub et al., (2002) Leidner and Kayworth (2006) and Srite and Karahanna (2006).

The author has also noted that Saudi Arabia has witnessed significant transformation in the last fifty years and has become one of the major economic forces in the Middle East. During this time, the country has achieved advancement in internet and other technologies in spite of its conservative paradigm. However, the discord between technology and conservatism often leads to conflicts of interest (Cardon and Marshal, 2008). According to Internet World Stats (2008), Saudi Arabia achieved an internet growth rate of 75% between 2007 and 2008; however, according to CITC (2011), only 44% of the population actually uses the internet. Van-Slyke (2010) states that one major reason for the lower acceptance of the internet is the socio-cultural climate of the country. Abu-Mosa (2008) understands that the acceptance of technological innovations in a given society is shaped by its cultural values and beliefs and often comes into conflict with culture if adopted. Van-Slyke (2010) further states that lower acceptance and usage of the internet in the Arab world is due to inconsistency between

innovation and the cultural environment. Straub et al. (2009) also understand that the reluctance towards internet adoption and other innovative technologies in the Arab world is due to cultural beliefs and values.

Further it must be noted that Saudi Arabian Culture is more or less same due to five key reasons, the wahabbi Islam, Tribal nature of the society, collectivism, gender segregation and male dominant society in addition to many other smaller traits that have been discussed above and elsewhere in this paper. These three aforementioned elements make the cultural identity of Saudi Arabia along with others. For example Researcher such as Kumaraswamy (2006), Neo (1998) and Baroni (2007) have stated that the cultural homogeneity of Saudi Arabia is due to Wahab form of Islam which is the religion of the state and people are bound to follow its teachings. Similarly Baron (2007), Blanchard (2010), Zuhur (2005), Long (2005) and Long and Maisel (1997) have stated that the homogeneity of Saudi Culture is due to the tribal nature of the society and the prevailing tribal norms and traditions in the society. Further Darwesh and Huberr (2003) and Sampson (1997) have stated that Saudi Arabia is a collectivist society where an individual's decision is influenced by the family and tribe and their overall decision is more important than an individual. Similarly from Alhazmi and Nyland (2013) it is evident gender segregation is a key element of Saudi Culture which results in male dominance in the society which according to Kabaskal and Bodur (2002) is due to Wahabbi Islam and also as per El-Fadl (2001) due to the tribal nature of the society.

Thus from the above it is evident that since Saudi Culture is homogenous to a larger extent from which the author assumes that the impact of culture on innovation adoption (e-procurement in this case) will be affected in more or less similar way across all SMEs in the country.

- **Positive Impacts**

Although Saudi Arabia is a conservative society, recent advancements in technology, education and trade have changed people's perceptions, especially those in authoritative positions (Government), towards the benefits of innovative technologies. As a result,



ministries for communication and e-commerce have been set up to raise people's awareness. The scenario of authoritarianism can be a blessing in this regard, as the king and royal ministers can impose changes on the masses (Erumban et al., 2006).

Even the most conservative cultures of the world never remain static, especially in the current globalised business world, and thus changes can be accepted that were once out of question as long as they do not deviate from the fundamental and core values of the society. The ground is thus improving for ICT adoption, including e-procurement, although the pace is very slow. As argued by Hofstede (2001), educational development, oil wealth and expatriate workers have led to a less homogeneous culture in Saudi Arabia than in the past. Therefore, there is more room for acceptance of technological innovations than in the past.

- **Negative Impact**

Receptiveness to change varies from culture to culture and the worst case scenario arises when the majority of the population view changes as risks to their core values and traditions (Erumban et al., 2006).

Some cultures have a past orientation and resist all changes that influence their behaviour, tradition and values. In such cultures, the past has sanctity and people's collective minds are held firmly by past traditions. Even cultures that have a present orientation can be resistant to changes. Saudi Arabia has a conservative culture where people have high regard for their cultural and traditional background, and thus have strong resistance to changes that influence these things. The authoritarianism in Saudi tribes and society extends to the workplace, and thus the owners decide whether to introduce changes or not (Abu-Mosa, 2008). Saudi Arabian culture is not very diverse and decisions are made based on intuition and authority (Baghdadi, 2013). Thus, culture can be a hurdle to the adoption of e-procurement.

## 2.15 The concept of SME

From an academic and literary perspective, SME is a wide concept and there is no single accepted definition. The author therefore explores a variety of sources to better understand the concept. As discussed by Reboud et al (2011), although a variety of definitions exist for SMEs, most of them are based on the environment in which SMEs exist and few have a theoretical basis. Gabrielli and Balboni (2010) stated that:

*‘SMEs’ definitions based on profit, assets or turnover have accounting and statistical holes because these can be erased by inflation easily and also definitions based on the number of employees in the organisation can be dubious too”*

McMahon et al (1993) also state that there is an enduring and vexing difficulty in terms of providing a universally accepted definition of SMEs that has a strong theoretical basis. McMahon et al (1993, p.9), therefore understand that:

*‘SMEs are difficult to define than to describe them because there are small, tiny characteristics in SMEs that distinguish them from larger enterprises which are difficult to measure’*

According to Beck et al (2008), there are key financial management practices that distinguish SMEs from larger firms: for example, owners’ investments are undiversified, liability in the true economic sense is very limited, they are not publically traded, managers are mostly owners, the relationship amongst employees is informal, transaction costs are high and managerial expertise is general rather than specific, etc.

These differences can be vital in terms of establishing a universally accepted definition of SMEs. However, even the individual criteria mentioned above are not always applicable: for example, having a single owner and the owner being the manager would bring a huge firm such as Microsoft into the category of SMEs, as it is both owned and managed by Bill Gates.

Therefore, it is very important to have a more generalised and descriptive view of SMEs to distinguish them from larger enterprises.

### 2.15.1 SME's working definitions and Saudi Arabian SMEs

SMEs do not have a universal definition and thus their definition varies from country to country. For example, in the USA, a firm is referred to as an SME if it employs fewer than 250 people. However, it further varies from industry to industry and between types of business: i.e. service, manufacturing, construction etc. (No, 2010). In Japan, an SME is defined as a firm that employees between 4 and 299 people, but again, the definition varies based on industrial sector, revenue generated and capital invested. According to the European Commission Guide to (2015), an SME is defined by the number of employees, annual turnover and balance sheet total. Keeping all these definitions in mind, the European Commission (2015) guide to SMEs states that an organisation is categorised as an SME if it employees fewer than 250 people, has an annual turnover of not more than 50 million Euros and has an annual balance sheet of less than 43 million Euros. This classification is shown in detail in the table below.

Thresholds (Article 2)			
Enterprise category	Headcount: annual work unit (AWU)	Annual turnover	Annual balance sheet total
Medium-sized	< 250	≤ EUR 50 million	≤ EUR 43 million
Small	< 50	≤ EUR 10 million	≤ EUR 10 million
Micro	< 10	≤ EUR 2 million	≤ EUR 2 million

EU Characteristics and definition of SMEs (EU Commission, 2015)

In the Saudi Arabian context, SMEs have been defined by many trade unions and authorities, but a widely acceptable definition is formulated by the Riyadh Chamber of Commerce (RCC, 1999), which defines an SME as an organisation that employees between 20 and 100 people. The author will therefore use the RCC (1999) definition of SMEs as a working definition for this research.

Category	No. of employees	Capital
Micro	1–2	Less than USD 27,000
Small	3–49	USD 27,000–1.3 million
Medium	50–200	USD 1.3–13.3 million

Source: JEG.ORG.SA report 2015

### 2.15.2 Saudi Arabia and its SMEs is an Interesting Case Study (Saudi Arabian Economy)

Saudi Arabia has 25% of global oil reserves and is the biggest economic power in the Middle East (Salameh, 2011). The country has recently achieved macroeconomic stability through growth in the consumer market, and the GDP rate is very strong. Global investors are showing greater interest in the country, and many have invested in various business sectors. Recently, the government has taken some important steps, such as the establishment of six modern “economic cities” in different parts of the Kingdom. The country’s economy has grown substantially since it achieved membership of the World Trade Organization (WTO) in 2005. According to the World Bank Annual Economic survey for 2009, the Kingdom of Saudi Arabia was declared the strongest economy in the region. Also, a combined survey conducted by the International Finance Corporation (IFC) and the World Bank identified it as the most suitable place for business in the Arab region five times in a row. In the World

Bank Annual Report for 2010, Saudi Arabia was declared the 13th strongest economy in the whole world (ATEX, 2011).

### **2.15.3 Overview on SMEs in Saudi Arabia**

According to Al-Saleh (2012), SMEs make up 97% of total business in Saudi Arabia. He further stated that 86% of these are small enterprises and 11% are medium-sized enterprises. SMEs contribute 28% of the total GDP generated by the private sector of the country. The development of this sector is, therefore, of highest importance for the economic growth of the country, particularly since it joined the WTO in 2007 (CITC Report, 2012).

The modest contribution of SME to the Gross National Income of any country means that they have a smaller role than bigger firms in developed and underdeveloped countries of the world. This means that SMEs require a lot of support and encouragement to play a bigger and more central role in the economic growth of any sector. As discussed by Alsulamy (2005), one of the key challenges and weakness of SMEs is their level of performance index, which shows that they exploit 35% of energy and represent only 14% of production. Alsulamy further stated that the index also shows that these SMEs export only 8% of overall exported goods, which is a clear waste of financial and economic resources. Another key challenge and weakness specific to Saudi SMEs, according to Alsulamy (2005) and Aljafery (2002), is the limited number of Saudi people working as employees in them, which at only 2% is far below the number in developed countries such as the USA, where this ratio is 50%. This is an indication that Saudi SMEs create very few jobs for the local people (CIA, 2009).

### **2.15.4 Challenges to SMEs in Saudi Arabia**

Saudi Arabian SMEs exist in a discouraging and hard environment, because the environment is hostile and the SMEs have little internal capacities and investors are reluctant to invest in it. For this reason their enterprise needs are very difficult to meet. According to Alshaib (2000) majority of SMEs in Saudi Arabia failed or declared bankrupt in their first year of operation because they do not get support either from the government, financial institutions or industrial chambers that they need to get. Similarly according to RCC (2003),

SMEs represent a larger sector of the business industry in Saudi Arabia and their role is maumental but they havn't received the kind of support that they need. According to JEG (2015) report the limited performance of Saudi Arabain SMEs is due to lack of continuous support services by the government and financial instituates (both private and public). The key lack of support service is access to equity and debt (capital) which is critical for the growth and survival of any business venture. The scarcity of loan available to Saudi Arabian SMEs is evident from the fact that it is only 3% of total loans which is extremely low as compare as compare to the average 20% of other emerging developing countries and 25% in developed economies of the world.

Beside the importance and considerable size of SMEs, financial instituates hesitate and avoid giving loans to SMEs, due to many reasons. Some are as follows

- There is lack of credible information about these SMEs and as a result the financial bureaue can't allocate them with credit scores which serve basis for lending in major economies of the world (JEG, 2015).
- Similarly there is no legal enforcement or collateral registry to have a check on the defaulted SMEs (JEG, 2015).
- Since most of the SMEs do not have proper financial auid in place, the financial instituates have to spend extra to provide those services which are then passed on to SMEs in the form extra or premium charges (JEG, 2015).
- Majority of SMEs i.e. upto 85% have a single owner who in most cases are the CEOs ass well, makes it difficult to differenciate between private asset and a company which further increase the rest in offering loans for financial institautes because in case the CEO dies, who will be responsible to return the loan (JEG, 2015).

Therefore there is a greater need for the government and commercial industry to update trade laws and policies as well as strategic co-ordination with these SMEs to make obtaining capital easy for them.

### **2.15.5 Technology and Internet Use in Saudi Arabia**

The real journey towards internet use in the kingdom of Saudi Arabia started in 2001, after the telecommunication act was passed. The telecommunication authority gave licence to 42 different internet service provider companies to offer the facility. However, only 18 of them are actually in operation, as the remainder were unable to start working. Similarly, the majority of households, i.e. approximately 94%, watch television, of which 48% use satellite television and 52% use cable television (Arab ICT Advisors, 2007).

### **2.15.6 Internet Use in Saudi SMEs**

The extent of internet use in Saudi Arabian SMEs is difficult to establish, as most of the studies conducted in this regard have focused on larger companies. According to Adaileh (2012), the majority of SMEs have websites and use the internet but only for promoting business and not for business solutions. He further stated that there is a general perception that Saudi Arabia is very advanced in the use of the internet. Nonetheless, SMEs use the internet as a tool to communicate with customers; although most of these SMEs have websites, these websites do not play any role in business operation.

### **2.15.7 Evaluation of Various ICT Sectors in Saudi Arabia**

Saudi Arabia has made great advances in the development of ICT sectors and GIT statistics reveal that its ranking has increased by six places in 2012 as compared to 2009. Changes in the regulatory environment and improvements in infrastructure and network readiness have been the main reasons for this advancement. The government of the country has a broader vision of technology and is willing to give support to all public and private sector companies in the use of technology (GIT Report, 2012). There are an estimated 15.2 million internet users in the kingdom and the penetration rate is estimated to be 52% (CITC, 2013). It is, however, expected that the availability of fibre-optic in the country and the mass availability of smart phones will increase the users significantly in the future.

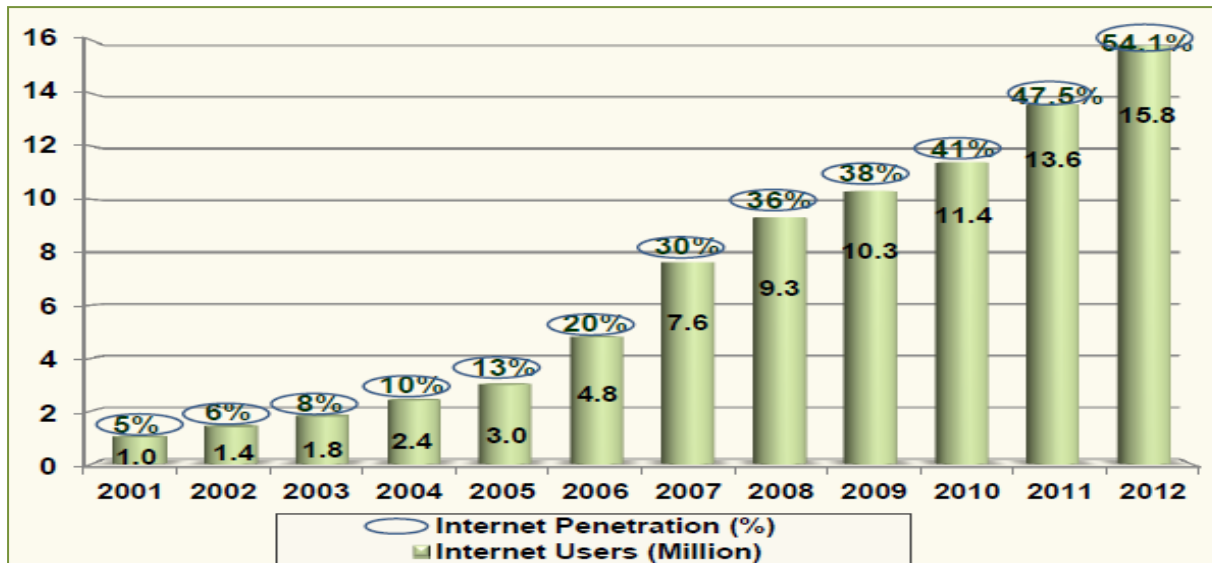


Figure 1: Internet Market Evaluation (Source: CITC Annual Report, 2013)

Government support and interest in digital and high tech infrastructure for various government projects and widespread demands for internet use in society have significantly increased the broadband service in the Kingdom. Hundreds of thousands of people in the country rely on the internet for downloading applications, chat programmes, social networking and other things. The country has both fixed and mobile broadband services (CITC, 2013). According to CITC (2013), broadband subscription in the country, including FTTs, WiMax, DSL and other fixed line services, has reached 2.25 million. The penetration rate is 36.5% of households.



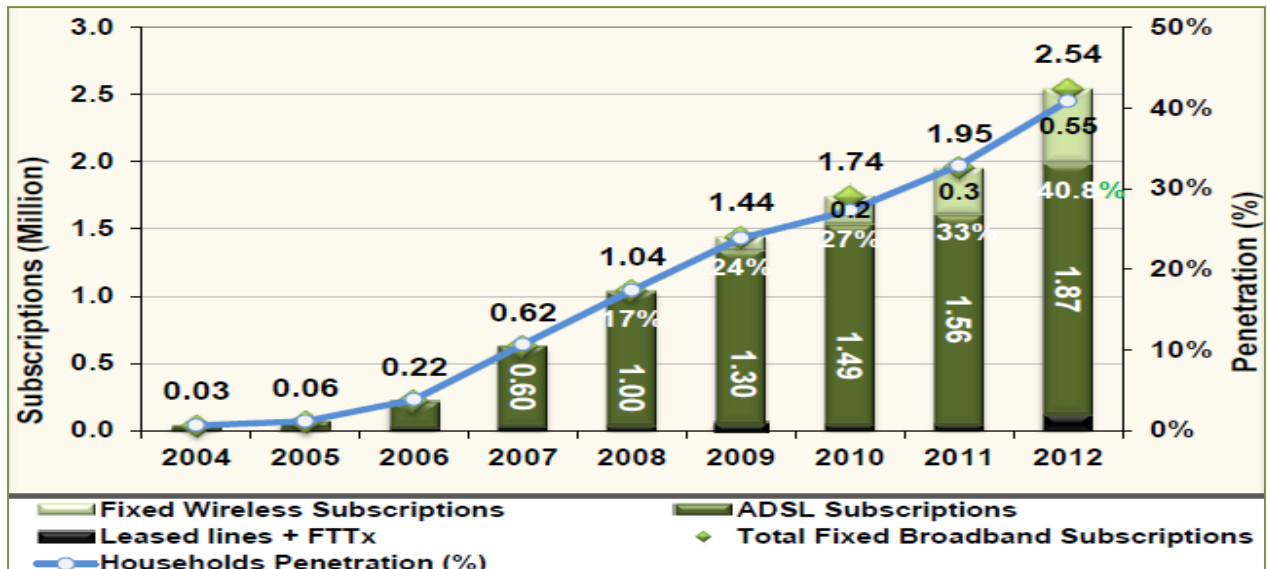


Figure 2: Broadband Market Evaluation (Source: CITC Annual Report, 2013 )

## 2.16 Summary

This chapter has explored the e-procurement literature in detail, specifically investigating five areas (elements) of the model and also the cultural aspects of technology adoption in Saudi in comparison to other cultures e.g. US. The chapter started by providing definitions of e-procurement related terminologies and the background knowledge of the concept. The literature review has helped in evaluating various previous models and theories along with their strengths and weaknesses. It has also helped in clarifying the key factors in relation to the chosen e-procurement adoption model to understand its efficacy and importance in Saudi Arabian SMEs. The literature review has helped in understanding the Saudi environment in comparison with the western developed world, particularly its national and organisational culture, infrastructure, education level and other core societal norms in order to investigate its impact on e-procurement adoption. The literature reveals that no previous study has been conducted in the kingdom on the proposed model, which needs to be modified in order to investigate cultural and external factors that are important for the adoption of e-procurement in the context of Saudi Arabian SMEs.

## **Chapter Three**

### **3. Research Methodology**

#### **3.1 Introduction**

This chapter details the research methods adopted and the motivation behind the chosen research approach. The previous chapters have presented a detailed background of SMEs, e-procurement, definitions, features and factors that are important for the adoption of e-procurement. A detailed study of e-procurement and SMEs literature and previous studies allowed us to select a model – namely the Gunasekaran and Ngai (GN) model (2009) – that is relevant and suitable for the adoption of e-procurement within Saudi Arabian SMEs. The chosen model will provide a foundation for the theoretical framework for this research. The chosen methodology will therefore act as a protocol based on the chosen model to collect data from selected SMEs so that the research questions can be effectively answered and the selected model validated.

In any research, it is vital for the researcher to know all the elements of the research process, such as philosophical and theoretical issues and underlying management methodologies (Sadler-Smith et al., 2000). This chapter will give a detailed account of the quantitative and qualitative methodologies adopted to investigate the factors affecting the adoption of e-procurement in Saudi Arabian SMEs. Questionnaire and interview techniques will be respectively adopted to collect data from a sample of the population (management and staff) within four selected SMEs. The chapter will also discuss the data collection tools and techniques for data analysis.

### 3.2 Research Philosophy

This research is based on the philosophy of positivism, which is based on a belief that human behaviour can be studied in the same manner as natural sciences (Collis & Hussey, 2003). The positivistic approach is very important to measure and evaluate different phenomena and provide a justification for them. Positivism is suitable for this research because there is a need to investigate people's perceptions about the use of e-procurement, their trust in technology and their cultural background and its impact on the adoption of technology. Stahl (2007) stated that most IS researchers and scholars agree that the basic tenet of positivism is that reality is independent of the observer. Many scholars, such as Myers and Avison (2002) and Vary et al (2002), have used and appreciated the philosophy of positivism and have called it by the term 'objectivism' or 'realism'. This collection of different philosophical terms indicates the applicability of the approach in exploratory empirical research.

Positivism has a long and rich historical background and considers scientific and logical methods to derive findings from empirical data using the deductive approach (Charmaz, 2014).

The explanation and justification will try to establish a relationship between various factors mentioned in the model and the adoption of e-procurement within the Saudi Arabian SMEs. There is a general consensus that people respond to the changes happening in their surroundings and this can be identified via a deductive systematic approach. Some of the key advantages of a positivist approach are as follows:

- It is ideal for research using a structured qualitative approach;
- It is good for research that is descriptive in nature and which investigates and measures the importance of different elements for any specific phenomenon (in this case the adoption of e-procurement);
- A standardised approach is vital to collect and analyse data easily;
- Other researchers can easily adopt the same methods and models to test in a different context and generate their own findings.

### 3.3 Research Strategy

There has been a long debate over the years about the suitability, strengths and weaknesses of qualitative and quantitative research methodologies. Experts have put forward strong written and verbal evidence to justify one or the other approach. Bryman (1993) stated that:

*“Qualitative and quantitative methodologies are competing views about the ways in which social reality ought to be studied, and as such are essentially divergent clusters of epistemological assumptions.”*

However, Bergman (2008) has conceded that, in contrast to the perception that these two methodologies are rivals; they can actually be integrated and used alongside each other in research to answer certain types of research question. Denzin and Lincoln (2000) have stated that qualitative research is concerned with processes, qualities and meaning, which cannot be experimentally quantified or measured, while quantitative research is associated with intensity, amount, frequency and quantity. Thus, qualitative research helps in understanding a phenomenon, while the quantitative approach is used to quantify and measure that phenomenon (Alvesson and Deetz, 2000).

The author has used qualitative research to assess the validity of existing elements in the literature within each of the factors of the research model, and then used a quantitative research methodology (AHP) to assess which element is more important in the context of each of the four SMEs and overall, so as to help in choosing the form of e-procurement that best suits the context of Saudi Arabian SMEs. This will also help in comparing the priority of these elements with the original research to find out how the impact of these elements varies from a developed to a developing country (USA vs. Saudi Arabia).

### 3.4 Research Approach

Adams and Schvaneveldt (1985), state that a chosen research methodology must be appropriate to the task. As the suitability, strengths and weaknesses of qualitative and quantitative methods have already been explained, here the researcher explains the method being chosen for this research.

Hussey and Hussey (1997) understand that for a research approach or plan to be useful, it must be based on four key criteria: i.e. process, purpose, logic and outcome. Saunders et al. (2003, p. 91) called this approach the “research onion”, where the researcher unwraps different layers of research philosophies and orientations. Simply speaking, the two approaches follow a simple dichotomy that provides a clear path for a comprehensive and consistent research methodology and helps to conceptualise different directions within social science research. Hussey and Hussey (1997) further state that a study can be classified as exploratory, descriptive or explanatory depending on its purpose and aim. Exploratory research is used when there is very little or no existing information (literature) about a given phenomenon and thus information is needed to answer the research questions. Collins and Hussey (2003) thus state that in the exploratory research approach, the researcher looks for ideas, patterns and hypotheses, and does not seek to confirm or test these hypotheses. The purpose of exploratory research is to get as much information as possible and rarely provide specific answers to the issue or problem but provide a foundation for future research if conducted (Hussey and Hussey, 1997). Descriptive research is adopted in a situation where a given phenomenon exists and a solution is needed (Hussey and Hussey, 1997). Such research can be adopted in particular problem situations using statistical techniques or qualitative methodologies. Exploratory research is carried out in order to find out how and why something takes place in a given situation. Researchers try to understand phenomena by measuring fundamental relationships between them (Collis & Hussey, 2003). Some measure or quantification of variable factors is carried out for better understanding and evaluation of the relationship between them

Predictive research is used to find out the likelihood that a specific phenomenon will take place under specific circumstances. Predictive research mostly (almost always) follows a quantitative approach because it entails defining/ identifying quantifiable (measurable)

variables that need to be analysed and manipulated in such a way as to cause quantifiable (measurable) effects. Hussey and Hussey (1997) stated that predictive research provides 'why', 'where' and 'how' answers to prevailing current events and then predicts future events based on current available information and trends. Deductive research follows a positivistic approach which is quantitative in nature and allows the researcher to develop and test hypotheses or theories via empirical observation and general inference. According to Hussey and Hussey (1997), a deductive approach leads research from a general to a more specific and particular scenario. Inductive research, on the other hand, is a more phenomenological approach which, in contrast to the deductive approach, starts from a particular situation and leads to a more generalised scenario. According to Hussey and Hussey (1997), it takes a researcher from a specific observational statement or statements to a generalised law or pattern, i.e. moving from a specific/particular scenario to a general pattern.

Hussey and Hussey (1997) further state that applied research is designed in such a way that its findings can be applied to solve existing, specific problems. Further, it is used to clarify specific research problems and help in increasing knowledge on general issues. Generally, it is very important in research to select an approach that fulfils the objective of the study and focuses on the selection of methods to solve the problem and research gap, immediately after defining the theories at the start of research. It is one of the key tasks that need to be completed during any type of research. However, it must be kept in mind that there are many factors that must be taken into consideration when selecting a suitable research methodology, such as the research problem, research objectives and research questions. Remenyi et al. (1998) stated that a thorough literature review is pivotal not only in identifying a research problem but also in selecting a suitable methodology to conduct the research.

This study aims to investigate factors affecting the adoption of e-procurement in Saudi Arabian SMEs using the Gunasekaran and Ngai (2009) model. The use of and replication of an existing model in a different perspective is in line with Ketokivi and Choi (2014) who have stated that generalised empirical context of theory can be elaborated via theory testing and theory building as shown in the figure below.

### Modes of conducting case Research

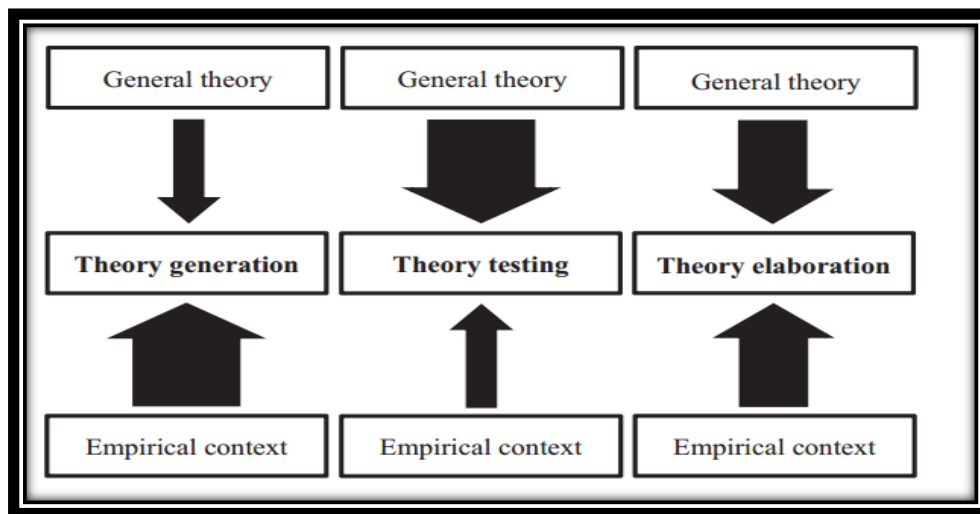
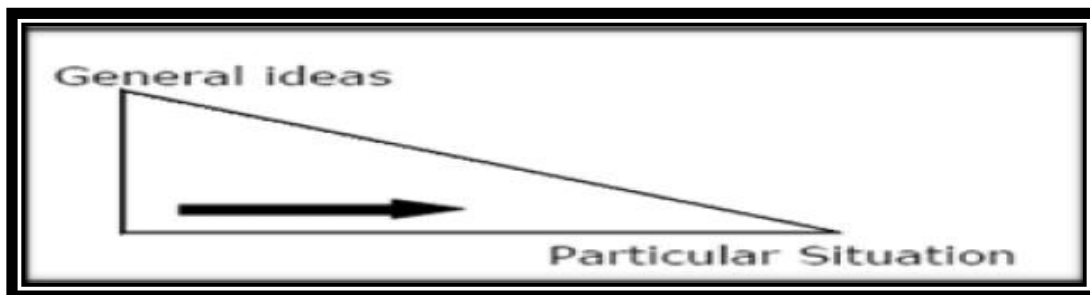


Figure 3.1: Adopted from Ketokivi and Choi (2014)

Ketokivi and Choi (2014) have further stated that using existing theory in a similar logical ground is significant in resolving theory with the new empirical context. They further stated that new elements or concepts can be added to the existing theory based on the empirical data as it is directed by an existing tested theoretical consideration. This research is based on theory elaboration case research mode where a general theory of GN (2009) is contextualised to Saudi Arabian SMEs context. The research elaborates the existing logic because the context (Adoption of e-procurement in Saudi Arabian SMEs is not well known to deduce testable hypothesis as per Ketokivi and Choi (2014). Also from Ketokivi and Choi (2014) and Ketokivi (2006), the approach is ideal for exploring new context in more latitude and depth.

Based on this model, the research investigates five key factors: current status and readiness to adopt e-procurement, perceived benefits, perceived barriers, critical success factors and future organisational performance. Thus it leads the researcher to adopt an exploratory approach at the initial stage so as to get sufficient knowledge of the research topic and issues that need to be addressed. A deductive approach will follow, to analyse general ideas and generate more specific ideas and theories in relation to the adoption of e-procurement in Saudi Arabian SMEs.



**Figure 3.2: Source (Hussey & Hussey 1997)**

Since there is little or no literature available on this topic in the Saudi Arabian context, the exploratory approach will be pivotal and will allow the researcher to find trends and patterns in the data gathered, instead of confirming or testing an existing hypothesis (Hussey and Hussey, 1997). Due to the scarcity of relevant literature in the Saudi Arabian context, other approaches would not be appropriate to fulfil the research aims and objectives. The researcher is thus reluctant to use any other approach such as descriptive or predictive research at this stage because the aim at the initial stage is to build knowledge instead of finding relationships between variables or developing a phenomenon. In line with Collis and Hussey (2003), Saunders et al. (2003) and Hussey & Hussey (1997). The aim of using exploratory quantitative and qualitative approaches is to gain insight and familiarity with the research problem area so that it can be better understood and provides a strong foundation for more in-depth and detailed explanation.



### **3.5 Research Process**

In order to achieve the aims and objectives of the research, the author started with a literature review to build a theoretical framework. The research process adopted for this study consisted of three key stages of data collection. First of all, an exploratory study was conducted on two selected Saudi Arabian SMEs to understand the main factors influencing e-procurement adoption in Saudi Arabian SMEs and the relevance and suitability of the framework (research model).

Secondly, a detailed quantitative study was conducted on four selected Saudi Arabian SMEs to find the relative importance and priority of various elements of the GN (2009) model in selected Saudi Arabian SMEs. SMEs from different types of business and of different sizes were selected so that an overall realistic view of SMEs could be gained.

Thirdly, a detailed qualitative study (involving semi-structured interviews) was conducted with an aim to identify additional elements/factors contributing to the adoption of e-procurement in Saudi Arabian SMEs. The detailed qualitative study allowed us to take cultural and other external factors into consideration, as they are vital for the adoption of e-procurement. The researcher therefore used multi-staged interviews to gain an insight into the prevailing cultural and external factors in the adoption of e-procurement.

Subsequently, the original GN (2009) model was modified to integrate perceived external and cultural factors with the adoption of e-procurement in Saudi Arabian SMEs.

One of the key issues that the researcher faced initially was the selection of SMEs, because there are more home-based, unregistered SMEs than those that are registered and there is no single listing of SMEs that could have been of help. Only businesses that operate in a formal way are registered by the Ministry of Commerce. However, that list of registered SMEs includes many SMEs that were once registered but no longer exist. Similarly, some businesses have been registered under several different names in order to attract specific types of customers.

The research process for this study was comprised of the following steps:

- Problem identification and formulation of research questions to be answered;
- Background study and analysis of the problem area in a wider global context, and then narrowing it down to the Saudi Arabian context to arrive at a conclusion;
- Collection, evaluation and analysis of data (qualitative and quantitative);
- Summing up the research findings to arrive at a conclusion that can be used in current as well as future research contexts.

### **3.6 Data Collection**

Data is generally collected from two sources, i.e. primary and secondary sources. Primary sources include observations, surveys and interviews, while secondary sources include journals, books, publications, magazines, newspapers, media and the internet. After a research problem has been selected, research questions prepared and the necessary relevant literature reviewed, a specific data collection method needs to be considered. The two main and key research methods, as stated earlier, are quantitative and qualitative, and each has its own collection techniques and ways to collect data.

Quantitative research is an objective approach that collects and analyses numerical data and subjects it to statistical tests to obtain measurable (quantifiable) findings (Collis and Hussey, 2003). The key aim of a quantitative research method is to measure the frequency, range and scale of a specific phenomenon. This type of research is well structured and detailed, although harder to initiate. Further, the results of quantitative research methodology can be easily presented and collated.

Qualitative research, in contrast to quantitative research, stresses words instead of measurement and quantification of data in collection as well as analysis (Bryman, 2008). In the majority of research studies, the researcher prefers to use one of the two methods; however, in many cases, both methods are used in conjunction. This is called triangulation (Bryman and Bell, 2003). This study has adopted triangulation, using both qualitative and quantitative approaches in conjunction. Both methods have their own strengths and advantages, some of which are presented as follows:

Qualitative methodology	Quantitative methodology
A large, diverse and rich body of data can be collected	Transparent and clearer in terms of research
Can be easily linked to one's own work	Well controlled
Much closer to the reality of respondents' lives and the context under which it is collected	Based on systematic observations
	Identifiable and specific number of responses
	Based on a generalised sample in a large pool of data

**Table 3.2: Advantages of qualitative and quantitative methods (Collis and Hussey, 2003)**

Data were collected from four selected SMEs with a number of employees: this resulted in a huge volume of data being collected and analysed. Since the research strategy and approach had been carefully determined in advance, secondary data was collected from various renowned sources to fill the research gap and explore various relevant issues. Secondary data is data from academic journals, newspapers, research foundations, government departments, associations and annual reports of different SMEs and government ministries (Diamantopoulos and Schlegelmich, 1997). Secondary data is considered very suitable because of the lack of time, human and financial resources that are needed to collect it as compared to primary research. Similarly, secondary data from authentic and renowned sources is highly reliable and valid in the context of this research. Secondary data in addition to renowned journals and publications were collected from the Saudi Ministries of Commerce and Communication, business centres, chambers of commerce and Saudi national statistics. The aforementioned sources are very important not only to get an overview of the current status of the SMEs and industry but also to gain insight into related issues/barriers and perceived benefits that can be obtained as a result of e-procurement adoption. Additionally, secondary data were obtained from the official trade associations in order to get further details and great insight into the success of SMEs. The research has also taken into consideration different surveys and reports in order to obtain a full view of SMEs and the critical success factors for their adoption of e-procurement. Studies conducted on the adoption of e-procurement in SMEs in different developed and

developing countries were examined not only to gain insight but also to find similarities and differences. Internet-based sources such as digital libraries, articles, newspapers and blogs were also taken into consideration. Many relevant newspaper articles, journals and publications regarding Saudi Arabian SMEs and general business industries were taken into consideration to provide a firm foundation to the research analysis.

### **3.7 Quantitative Research**

In order to collect data from selected Saudi Arabian SMEs, a comprehensive questionnaire was designed and distributed to various employees in selected Saudi Arabian SMEs. The questionnaire has questions related to all five key factors mentioned in the Gunasekaran and Ngai (2009) model. Respondents were asked to rate elements or factors within each of the five elements on a scale of 1 to 9 based on the importance of that each factor in the context of that SME. The main advantage of a questionnaire is that it is cheap and data can be collected in a short period of time. Similarly, it allows the respondents to think and answer the questions in a location of their choice and in their own free time. Unlike interviews, in questionnaires they do not need to panic and have plenty of time to answer the questions, and can even consult someone if they are confused. A questionnaire can be defined as:

*The collection of data on a number of units and usually at a single juncture in time, with a view to collecting systematically a body of quantifiable data in respect of a number of variables which are then examined to discern patterns of association.*(Bryman, 1989)

The following are some key advantages of the questionnaire approach, according to Robson (2002):

- It is a cheaper technique and doesn't need many resources;
- It is very simple and doesn't require substantial training: only basic awareness and simple guidance is required;
- Many respondents can be involved at the same time;
- Questions can be customised to suit the respondent and the context of the organisation;
- It allows organisations to obtain feedback, which can be divided into different sections based on functions;
- Results can be modelled and graphed for visual reference;
- It allows the researcher to get a parallel and workshop view of the organisation and its operations;
- Questionnaires can be sent via E-mail or through the post in addition to handing them over to the respondents, which further reduces the cost and time of travelling and distributing them to individual respondents.

In addition to the aforementioned benefits, however, questionnaires have several weaknesses that must be acknowledged. As discussed by Saunders (2003), some of these weaknesses are as follows:

- Low response rate as some people will ignore it;
- Low response rate leads to a lower sample size, and ultimately the reliability of the result that can be obtained from the analysis of data can be compromised;
- There are many responses errors in answering questionnaires, which can be intentional or unintentional;
- Similarly, there might be some administrative errors by the researcher when he/she is putting together the data collected and subjecting it to statistical analysis because the volume of data is huge.

Some researchers suggest that a questionnaire must be accompanied with a covering letter that motivates and also provides necessary help to respondents, as this can improve the response rate of the questionnaire (Denscombe, 1998). Pintrich (1991) suggests that the use of motivational strategies can be of significant help in improving the response rate of questionnaires. One key strategy will be to encourage the respondents about the benefits of the survey for their future and the future of the SMEs. Similarly, the respondents must be assured that the information they provide will be strictly confidential and will be dealt with anonymously.

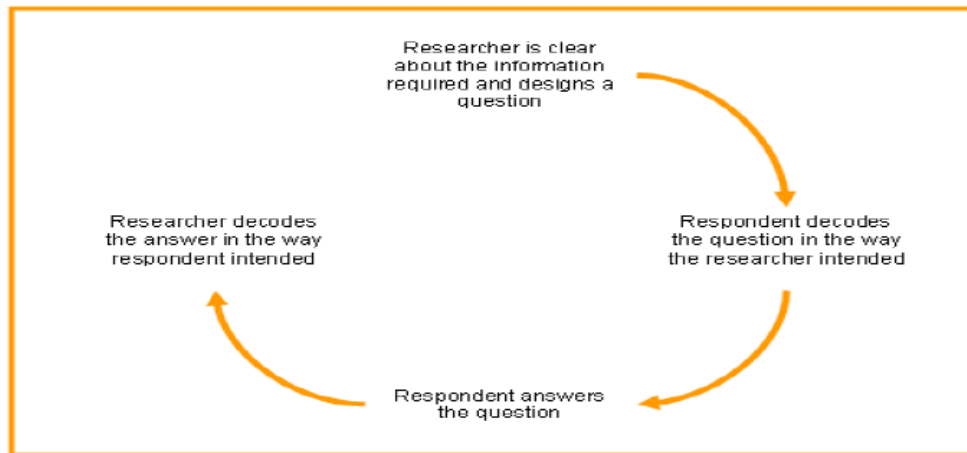
### **3.8 Reliability and validity of testing**

Reliability and validity is the degree to which an instrument or tool (e.g. a questionnaire) accurately measures what it is expected to measure (Bryman and Bell, 2007). The mixed approach used by the researcher is thought to be the most credible method of ensuring questionnaire validity (Pansissir, 2006). Many methods can be used to ensure the validity and reliability of questionnaires e.g. assessing the questions from two or more research experts to determine whether they measure what they should measure (Vogt, 2007; Ruane, 2005). The purpose of this research is to investigate the factors that affect the adoption of e-procurement in Saudi Arabian SMEs. An extensive literature review allowed the researcher to conclude that current status and readiness, perceived barriers, perceived benefits, perceived critical success factors, perceived future organisational performance and perceived cultural and external factors are the key elements the research will take into consideration to investigate the aforementioned research area.

The reliability and validity of data collected depends on the structure and design of questionnaire and also on whether pilot testing has been carried out before the actual data collection and testing. Pilot testing will identify any anomalies and weaknesses that can be overcome in actual data collection and testing. Foddy (1994) has stated that the consistency of responses and data collected is of key importance in this kind of research. The research will use AHP to find the consistency of results. Foddy (1994) has described consistency as follows:

*“The question must be understood in the way intended by the researcher and the answer given by the respondent must be understood by the researcher in the way intended by the respondent”.*

From Foddy (1994), it is evident that a questionnaire is considered valid and reliable if it passes through the following stages:



**Table 3.3: (Steps to Develop a Comprehensive Questionnaire) adapted from Alfaadhel (2010)**

After designing the questionnaire, the researcher discussed it with the supervisor and made necessary amendments based on the feedback to ensure that it was suitable for the purpose of this research. This was followed by an exploratory study in order to identify any anomalies in the questionnaire or problems that might be faced by the respondents. The questionnaires were written in simple English and a copy translated into Arabic was also provided to assist them in filling it out. They had the choice to fill in whichever version they wanted (English or Arabic).

The author has used semi-structured interview questions to collect responses from multiple respondents within each of the selected SMEs to double check the responses and to strengthen the reliability of the data collected. A quantitative methodology (AHP) is used to determine the relative priority of elements within each factor to arrive at a conclusion and to identify the most important elements in the Saudi Arabian context, which will be helpful in devising the best possible e-procurement solution in future from the many options available in the market. It will also assist in making a comparison with the original GN (2009)

case to identify how the importance of various elements varies between a developed and a developing country.

According to Cook and Campbell (1979), validity can be defined as the:

*“Best available approximation to the truth or falsity of a given inference, proposition or conclusion”*

In this study, interview validity was achieved in three ways. Firstly, the triangulation approach was used to ask the same question in two or more differently worded ways to determine whether the answer is the same or if it changes. Secondly, the same questions were asked of the respondents in each of the six SMEs to compare and contrast the responses. As per Dick (1990), the triangular approach gives the researcher the flexibility to rephrase the question, according to the mood of the target respondent, in order to achieve the same objective.

According to Sekaran (2000, p.204), responsibility refers to how consistent and unbiased the measuring metrics (interviews, questionnaires) are across different respondents. The reliability in this research was achieved by using a semi-structured interview process and by comparing the results of respondents from various SMEs to reach consistent findings.

In summary, the author undertook all possible steps to ensure the validity and reliability of both the data collection tool and the data itself.

In the following paragraphs, some of the key steps taken in relation to the interview questions and the sampling are explained.

### **3.8.1 Questionnaire translation**

In international research, it is very important that the meaning of the questions doesn't change when translated into a different language. The reliability and validity of the questions need to be reassessed after translation. Several techniques can be used to ensure the validity and reliability of the translated questions. Firstly, the source questions can be translated directly into the target language. Secondly, the questions can be translated back into the original language and the meaning can be checked to establish whether it is the



same. Thirdly, the original questions can be translated into the target language by two different translators and the two versions can be compared to assess the meaning (validity and reliability) against the source questions. Fourthly, a mixed technique can be used i.e. using a parallel technique, retranslating both versions back into the source question, determining which one is closer in meaning to the original and keeping that one for the purpose of data collection (Saunders et al., 2009).

The fourth technique is, therefore, the best option, although a little more time consuming, and the researcher used this technique to translate questionnaires from English to Arabic and back to ensure the highest reliability of the questionnaire and the data that was collected as a result of it. The original questionnaire was first verified by a supervisor and another PhD student. It was then translated by two English language PhD scholars at Riyadh University and retranslated into English by another two PhD scholars at the university. The retranslated version was verified again by two of the researcher's PhD colleagues in linguistics and the final Arabic language questionnaire was used to collect the data.

### **3.9 Justification of Sample Size (six selected SMEs)**

Due to time constraints, it is not possible or practical to collect data from everyone in the target population; therefore, a specific cases of the target phenomenon is selected that can be a representative of or exemplar a target research unit in terms of characteristics and features. The four selected SMEs were chosen from different industrial sectors and are of varied sizes, employing people of different levels of education and experience, to obtain a comprehensive view of the entire industry in Saudi Arabia. Of the six SMEs, Ahmed Bemarouf deals in cars and car parts, Al-Amazon provides consultancy services in water extraction and purification, Khatib & Alami provides services in the construction sector, while Al-Maram deals in perfumes and fragrances. Ahmed Bemarouf and Khatib & Alami are comparatively bigger firms, while Al-Amazon and Al-Maram are smaller firms with fewer financial and human resources and less expertise. Thus, the sample shows considerable variety in terms of human resources, and it is also varied in cultural traits, with some of the firms having expatriate employees.

The author used multistage interview procedure to collect the data for cases evaluation. The author originally conducted four case studies, which consisted of a total of 27 interviews, which was then extended to six case studies and a total of 40 interviews i.e . the author followed the Yin (2013) and paly(2008) idea of maximum variation in selecting the stackholder that would be effected by the phenominon or who will be responsible for implementing and using the phenominon i.e. the top management (the extreme) and the procurment employess (typical) along with other employees from various departments. The respondents included the top management and owners of all six SMEs, along with the heads of all departments and some employees. The author had to choose the study respondents carefully, because including all of them was practically impossible. Therefore, the author chose people who had knowledge of all departments to provide their views, because e-procurement affects all departments, which provided the ability to ascertain if any of the respondents had hidden something or had missed anything out in their interviews. Too few respondents would have created bias because each department or individual interprets or evaluates barriers from a different perspective, has different levels of knowledge or has different responsibilities within the process. In summary, the various respondents within each case were selected to have different point of views regarding every aspect of the process, related to their managerial and working perspectives. The respondents mainly included heads (mostly owners), deputy heads, heads of IT, heads of procurement, heads of sale etc. A larger number of respondents provide a variety of views regarding the same aspects, which lead to a richness of data in terms of various views and opinions regarding the impact of the adoption of e-procurement on them or their department and on the organisation as well. These variable views are listed in appendix.

### **3.10 Analytical Hierarchy Process (AHP)**

This chapter starts by selecting and introducing a suitable technique, namely the Analytical Hierarchy Process (AHP), which will prioritise different factors influencing the adoption of e-procurement in Saudi Arabian SMEs. As well as AHP, a number of other techniques are mentioned in the literature and adopted by various researchers to rank or prioritise factors, such as the Analytical Network Process (ANP) by Lee and Kim (2000), the Ranking Approach (RA) by Buss (1983) and Mathematical Optimisation (MO) by Badri et al. (2001). The analysis of these techniques, however, shows that they do not provide a preference structure for decision makers. Preference structure refers to the views of decision-makers regarding a single or multiple factors that affect the adoption of a process (Salmeron and Herrero, 2005). Kamal and Alsudairi (2009) state that the aforementioned methods are inappropriate in situations where a distinct factor is not the priority of decision-makers or when the intention is to choose a technology that works better for individual preference. Also, the application of these techniques in real world decisions is further limited by their complex mathematical models or features, for example their use in this research context (adoption of E-procurement in Saudi Arabian SMEs), especially where most of the factors are not proven in the context and they are difficult for managers to realise and comprehend.

AHP, in contrast, helps in prioritising a set of factors and compares their importance in multi-criteria problem solving (Wei et al., 2005). Kamal (2008) has also established the efficiency of AHP in prioritising factors in a multifactor analysis. Some of the key features of AHP in relation to other analysis tools are summarised in the following table (Table 3.4).

**Comparison of AHP and other analytical tools**

Characteristics of various Prioritisation Techniques	Prioritisation Techniques				
	RA	AHP	ANP	SMAR	DEA
Intuitive technique	√				
Easy to understanding the prioritisation process	√	√		√	
Requires less training and skill	√	√	√	√	√
More focus on quantifiable calculations	√		√	√	√
Easy to understand the problem of situation		√	√		
Structures numeric representation and symbolic		√		√	
Accessible data format		√			√
Supports different viewpoints through rich pictures		√			
Limited attributes to carry out real world decisions	√		√	√	√
Synthesised analysis of diverse judgements		√			
Incorporation of preference structure		√			
Measure the performance efficiency of decision makers				√	√
Resolves complex problems of choice and prioritisation		√	√		√
Graphical representation		√			
Structures through symbolic and numeric representation		√		√	
Techniques not appropriate for all situations	√	√	√	√	√
Providing a step-wise guideline for prioritising the factors		√	√		
Optimising resource allocation for interaction of factors		√	√		√
Captures individual knowledge and experience		√		√	
Quick insight into structure of information		√		√	
Applicability weakened by complex mathematical model	√		√		
Non-linear representation	√				
Time-consuming process					
Managing a large amount of quantitative and qualitative data		√			

Table 3.4: Adopted from Al-Fawaz(2012)

From the table, it is clear that AHP has distinct features compared to the other tools that make it ideal for decision-makers in expressing their specific preferences in complex problems of priority selection (Saaty, 1977). Saaty (1980) has mentioned that AHP is very useful in complex decision-making and setting comparative priorities of individual factors. Saaty(1980) further states that it helps in deciding a factor's comparative priority over other factors affecting the process, and it can be conducted via a step-wise comparison method. The reason for AHP's efficiency in such situations is clarified by Chan et al. (1999) and Wei et al. (2005), who state that it is because complex problems are divided into sub-problems and the results are then joined up to find a solution to the overall problem. Chan and Kumar, (2007) found that AHP is widely used to solve problems in the field of IS (Information Systems) by allocating weights and priorities to the factors needed for the solution. AHP can be used for qualitative as well as quantitative analysis or even in mixed approaches to solve specific problems. In qualitative methodology, complex problems are solved by breaking them down into a hierarchical structure, while for quantitative analysis pair-wise comparison is used to rank or prioritise factors (Wasil and Golden, 2003).

### **3.10.1 Data collection via pair wise comparisons by questionnaires**

In this step the data will be gathered via pair wise comparisons through a structured questionnaire. This step will be carried out in the following stepwise manner, as devised by Yang and Huang (2000).

- Working out different weights allocated to factors based on their importance over other factors using pair wise comparison.
- Computing the vector priorities of different factors in the form of percentages.
- Consistency of the verdict of the answer. In this step, the perceived factors within a specific category will be compared and prioritised within their specific category (current status and readiness, critical success factors etc.).

A similar method will be adopted for the factors in all five categories. Salmeron and Herrero (2005) state that there are various ways in which pair-wise comparison of factors can be

carried out and the consistency of replies regarding factors' importance depends on the knowledge level, management support and trust in the individuals filling in the questionnaires. The original nine-point scale devised by Saaty (1977) is used by AHP to prioritise the importance of different factors. This scale will be applied using pair-wise comparison to find the priority of individual factors within the category to find and allocate weights to individual factors. The original nine-point scale is shown in Figure 3.3

Pairwise Comparison scale for AHP Preferences	
Numerical Rating	Verbal Judgements of Preferences
1	A is equally preferred over B
2	A is equally to moderately preferred over B
3	A is moderately preferred over B
4	A is moderately to strongly preferred over B
5	A is strongly preferred over B
6	A is strongly to very strongly preferred over B
7	A is very strongly preferred over B
8	A is strongly to very extremely preferred over B
9	A is extremely preferred over B

Figure 3.3: Adopted from Al-Fawaz (2012)

Fundamental to the AHP technique is the process of pairwise comparison irrespective of the context or domain in which it can be applied. Whilst comparing these factors, their relative significance, probability or inclination can be established, based on the aforementioned scale. The proportionality of these factors does not need to be based on a benchmark scale, such as metres or feet, but rather on the strength of association and importance between factors. In simple words, it can be stated that while comparing two factors, one can judge one factor more important than the other or twice as important or three times as important as the other factor. The decision might be prejudiced at times; however, the comparison can be made *per se*. Researchers do have their reservations about scaling in the absence of any specific benchmarked scale. However, several pair-wise comparisons can be conducted together to derive an average, which increases the accuracy of this measure.

The average is calculated on the basis of a multifaceted geometric process via eigenvectors and eigenvalues. Farman and Selly (2004) maintained that this method has been extensively used and proved correct experimentally in various research contexts. There are

several comparison methods mentioned in the literature, of which the most viable and widely adopted is the aforementioned. In this method, the pairwise comparison of two factors in a questionnaire is modelled as  $WAB$ : i.e. the weight or importance of factors "A", in comparison to another factor "B" in the same category. The importance of B over A is represented as a reciprocal: i.e.  $1/WAB$ . The beauty of this method is that it reduces the number of comparisons to  $n(n-1)/2$ , where  $n$  represents the number of factors in a specific category. This process is adopted from Salmeron and Herrero (2005) and is applied in this research context to find the factor affecting the adoption of e-procurement in Saudi Arabian SMEs. Adopting this method is very important because it does not show any discrepancies: i.e. the importance of factor A over factor B will be related with the importance of factor B over factor A.

The transitive property, however, might not be true (i.e. the extent of importance or priority of A over B need not be in line with the priority of A over C and Cover B). As can be seen in Figure 6.2, the research has adopted a comprehensive nine-point scale. The same but opposite scale is used for the priority or preference of "B" over "A", i.e. the value of "A is strongly to very strongly prefer over B" is 6, so its inverse for B's priority over A will be  $1/6$ . It must be kept in mind that '0' priority cannot be allotted to any factor in pair-wise comparisons and '1' will be in the middle of the decision matrix, which means equal priority of a factor with itself or with another factor. Salmeron and Herrero (2005) have suggested that the judgement over the priority of factors in pair-wise comparison is arranged in a triangle of a square matrix: e.g.  $a_{ij}$  represents how much factor 'i' is preferred over factor 'j'. This means that  $a_{ij} = w_i / w_j$ . The factor in the diagonal of the square matrix is 1 and the factor in the lower triangle are the inverse of the upper triangle of the square matrix i.e.  $a_{ij}=1/a_{ji}=1/(w_j / w_i)=w_i/w_j$ . Each of the factors  $a_{ij}$ , represents the relative absolute priority ratio of a factor i over the relative absolute priority of factor j. The matrix adapted from Salmeron and Herrero(2005) thus becomes  $A= (a_{ij}), (i,j=1.....n)$

$$= \begin{bmatrix} 1 & \dots & a_{ij} \\ \dots & 1 & \dots \\ 1/a_{ij} & \dots & 1 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & \dots & w_j/w_i \\ \dots & 1 & \dots \\ w_j/w_i & \dots & 1 \end{bmatrix}$$

The above matrix shows the relative priority of one factor over the other in analytical hierarchy analysis. Similarly, it also shows the relative importance of a factor with itself, which is shown in the diagonal by 1: i.e. they are equally important. Further the matrix also verifies that  $Aw=nw$  where  $n$  is the total number of factors and  $w$  is their absolute priority or weight. This equality equation is used by research using AHP to find the priority of each factor in a category for analysis. Saaty(1977) has proved that  $n$  is the biggest eigenvalue of the matrix 'A' and the priority or weight we are looking for is associated with this eigenvalue. These priorities or weights are referred to as local priorities or weights, or in other words, comparative priority with factors within the same category.

### 3.10.2 Consistency Ratio

A consistency ratio ensures that transitivity rules are not violated by the decision-makers. A consistency value or ratio is derived from random judgements of the decision-makers using mathematical calculations (Saaty, 1980). Consistency values (CV) are shown in the following figure

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CV	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

Figure 3.4: Consistency values (CV) source( Saaty, 1980)

Consistency ratio (CR) can be calculated by following the steps below:



A. Calculate the sum of all values in a column and multiply it by the priorities

	a1	a2	a3	a4	Priorities
a1	1	1/4	4	1/6	0.112149
a2	4	1	4	1/4	0.248226
a3	1/4	1/4	1	1/5	0.058689
a4	6	4	5	1	0.580936
<b>Sum:</b>	11.25	5.5	14	1.616667	
<b>Sum*Priority:</b>	1.261676	1.365243	0.821646	0.93918	

Table 6.5: Calculate the sum of all values

- Find  $\lambda_{\max}$  by adding the values being calculated

$$\text{Sum*Priority: } 1.261676 \quad 1.365243 \quad 0.821646 \quad 0.93918 \quad \gamma_{\max} = 4.387745$$

- Find CI (Consistency index) using the following formulae

$$CI = (\gamma_{\max} - n) / (n - 1)$$

- Lastly, the following formula is used to find CR (Consistency Ratio):

$$CR = CI / CV$$

$$\text{By putting the values } CR = 0.129248 / 0.9$$

$$= 0.143609$$

One point that needs to be kept in mind here is that consistency should be below 0.1 (i.e. 10%) because otherwise the responses will be considered inconsistent (Saaty, 1980). AHP software notifies users when an inconsistent situation arises and thus responses can be rechecked to avoid an inconsistent answer.

### **3.10.3 Advantages and Disadvantages of AHP**

The main advantages of AHP lie in its ability and versatility to handle complex situations and also in the way in which it handles quantitative data. But just like any tool, AHP also has some disadvantages.

#### **3.10.3.1 Key advantages of AHP are as follows:**

- AHP can deal with multiple and complex criteria and can handle both quantitative and qualitative data (Mahdi and Alreshaid , 2005).
- It can deal with complex problems with multiple layers or levels because it uses the consistency ratio (CR) to quantify the cohesiveness of decisions (Banuelas and Antony, 2004).
- Trade-offs between the interests and objectives can be easily maintained (Mahdi and Alreshaid , 2005).
- Ease of implementation: i.e. in addition to its flexibility and versatility, it can be easily interpreted for hierarchical decision-making (Mahdi and Alreshaid , 2005).

#### **3.10.3.2 Disadvantages or criticisms of AHP:**

- AHP inherently involves rank reversal: i.e., the addition of a new factor or criterion disturbs the priorities of all factors in question. In some cases, this can be justified, but in other cases it will be hard to justify and will merely occur due to mathematical calculations. Thus the comparison is dependent upon the entire group and if one factor changes in the group, the whole group is affected (Markala and Jumpponen, 2006).
- Some people think the pairwise comparison is ambiguous because the question of setting the priority of factor A over factor B is irrational and doesn't fully explain the

extent of priority because the target people's judgment can be irrational (Leung and Cao, 2001).

- Another key criticism is on the length of the scale (1-9) because it puts a limit on the comparison and priority of different factors e.g. if factor A is considered five times more important than B and similarly factor B is considered five times more important than factor C, then logically factor A must be 25 times more important than factor C, but the scale does not allow us to do that (Markala and Jumpponen, 2006).

However, despite these disadvantages, AHP is still one of the most popular and effective tools to deal with complex decision-making scenarios and analyse data that can be easily understood and used in decision-making in the future.

#### **3.10.4 Key reason of using AHP in this research**

- To identify, from the list of elements under each factor, which one is the most significant(important) so if it is a barrier, companies and the government can prioritise overcoming this issue to facilitate smooth adoption. If it is a benefit, it will give the company guidance towards adoption based on the significance of that particular benefit for the company, and so on (Ugboma et al ,2006)
- Secondly, to compare the priority of similar factors in Saudi Arabia and those identified by Gunasekaran and Ngai(2009) in the southeast coast of the USA. This was important in finding out how similar factors are perceived and prioritised differently in different countries and perspectives (Saaty, 2008)
- Thirdly, the individual priority between smaller companies (e.g. Al-Amazon and Al-Maram) is different from that of bigger companies such as KA and Ahmed Bamarouf (Ahmed Bamarouf). This gives an idea as to whether benefits, barriers and other factors and their sub-elements vary from company to company in terms of priority or remain the same.
- Since there are many e-procurement solutions (software) available in the market, understanding the priority of elements will give an idea as to which one will be better for a specific company based on the priorities they want to achieve from the adoption of e-procurement (Saaty, 2013)

Therefore, the use of AHP is essential to arrive at a conclusion and find the elements that are of the most significance.

### **3.10.5 Justification for the need to prioritise AHP**

As mentioned previously, AHP is used to solve complex problems and to generate mathematical results that can be easily understood. Procurement adoption is a complex process because there are many factors and many stakeholders involved in it and an account of all these factors is important. AHP helps in quantifying opinions into a single decision model (Saaty, 2013; Saaty, 2008). A hierarchy of elements within each category can be ranked based on their importance obtained via questionnaires from the study respondents. Similarly, it allows researchers to find coherence in the judgements of the study participants and, if their responses are non-coherent, the researcher can go back and take the responses again until a consistency of below 10% is obtained. On successful completion, the relative importance of each element can be expressed in the form of a percentage and the elements can be ranked (Saaty, 2013).

The aim of this research was to explore elements within each of the five factors that affect the adoption of e-procurement. This was carried out using a literature review and qualitative data collection. Upon collection, the five factors became the nodes, while the elements within each category became the leaves of the hierarchical tree. However, it was important to know which elements come first in the hierarchy within each category (node) and which will follow. For this purpose, questionnaires were prepared e.g. respondents were asked to mark the importance of each of the barrier elements on a scale of 1-9 so that which barrier is the most important and which one is the least could be established based on the responses from each of the six SMEs i.e. 40 respondents. It was apparent that some respondents thought that a particular barrier was important while others thought differently. Therefore, an analysis tool was required to determine the relative importance of the barriers and then rank them into their order of importance. For correct analysis, it was important that the respondents' opinions should not deviate too much from each other i.e. they must be consistent. A consistency ration was therefore also calculated using AHP and a value of up to 10% was considered acceptable and anything above was not acceptable.

For this purpose, the author used the BSMSG AHP online system (available at: <http://bpmsg.com/ahp-online-calculator/>). This calculator automatically calculates the relative importance and the consistency ratio.

The AHP software used had a limitation in that it can only perform calculations for one respondent at a time. In order to overcome, Microsoft Excel was used to store the data and then to carry out various calculations. The analysis results of each of the 40 respondents for each of the factor elements were calculated and tabulated in Microsoft Excel, where their weightage was added up to find their overall weightage using the sum function. The Rank function was then used to arrange them in their order of importance i.e. 1 to n. The elements at the top are most important, while those at the bottom are least important. Thus, the objective of the study was reached and will also be helpful for future studies, government and SMEs for the adoption of e-procurement in selected Saudi Arabian SMEs.

### **3.11 Qualitative Research**

Qualitative research methodology is a well-established research method, and interview is one of the most popular and widely-practiced tools used in qualitative research (Rogers and Bouey, 1996, p.52). Interview tools used in qualitative research can be classified into three different types, namely structured, semi-structured and unstructured interviews. In a structured interview, the questions are prepared in advance by the interviewer and that list of questions is strictly followed and responses noted/recorded. In a semi-structured interview, there is a general list of areas and some pre-planned questions, but questions can be added or omitted on the run during the process of interview based on the responses of the interviewee. In such interviews, the response might lead to further questions to clarify the scenario. In an unstructured interview, the interviewer develops questions on the run during the interview process in a general area of interest/concern (Robson, 2002). Interviews can be used in both qualitative and quantitative research methodologies but the way they are carried out under the two methodologies has some key differences. Qualitative interviews are open-ended (unstructured) and more flexible and mostly lead to research hypotheses and the development of ideas as opposed to generating statistics and

gathering facts. However, in spite of all this, qualitative interviews also have some disadvantages, which include the following:

- It is difficult to compare results, as there are no standardised questions followed;
- Low level of reliability;
- Expensive technique;
- Takes a lot of time.

But the flexible nature of qualitative interviews allow researchers to frame questions based on the respondents' designation, understanding and situation to get an insight and highlight areas that can otherwise be difficult to evaluate with standard interview questions.

This research followed standard interview questions because there were specific objectives that the researcher wanted to evaluate using the GN Model (2009).

Creswell (1998) has stated that detailed interview is the best technique to obtain rich data on a specific context from multiple sources. Yin (2013) has stated that interviews provide valuable and detailed insight to obtain data relevant to specific research objectives. Creswell (2002) has emphasised that interview is the best technique in order to gain detailed insight and understand an individual, process or event. This is the main reason why the structured interview method was followed in this research. A total of thirty-one interviews were conducted across four selected Saudi Arabian SMEs. As explained by Yin (2009), interviewing leads to robust results and highlights new areas/factors, which is what the researcher was interested in. The researcher wanted to identify new factors specific to the context of Saudi Arabian SMEs that affect the adoption of E-procurement using the Gunasekaran and Ngai (2009) model. Aaker et al. (1997) has stated that an interview must be conducted in a relaxed and non-competitive environment in order to get detailed and reliable results and the researcher followed these guidelines, making appointments with all individuals and allowed them to choose a time and place of their own comfort. Since interviewing is very time-consuming and costly, it can only be used to collect data from a relatively small sample of the target population. Although the ideal number of interviews will vary based on the situation and context, Eisenhardt (1989) suggests that between four and ten interviews is considered satisfactory under varied circumstances. The greater the number of interviews

conducted, the greater the complexity of data and the harder it will be for the researcher to manage and generalise the results. Eisenhardt (1989) has further stated that it depends on the interviewer's own understanding, but ideally, once the researcher realises that there is minimal incremental learning from new individuals/cases or when the theoretical need is met based on observations or intuitions, the interview process must be terminated. Further, Eisenhardt (1989) has also stated that practical considerations in terms of time and money must also be taken into consideration in terminating the interview process for a given process or situation.

### **3.11.1 Objective of in-depth interviews**

Interviews are a valuable research tool for qualitative data collection and the key source of evidence for establishing case studies for a specific research (Yin, 2009, Gary, 2009). Interviews are particularly important when interpreting opinions, events and aspirations that need to be evaluated and analysed in a piece of research (Walsham, 1995). In the current research context, as mentioned earlier, the author used semi-structured interviews to collect primary data from the respondents. Since the owners and top management provide more information than other respondents in the SMEs, they were interviewed within each of the six SMEs. However other respondents were also interviewed to further justify their findings and to recognise their knowledge of SMEs and technologies, which was also very important for this study. In order to obtain more relevant information and decrease any researcher bias, face-to-face semi-structured interviews were conducted, as opposed to structured telephone interviews, where non-verbal language can't be seen. The former type of interview also make the discussion more informal, thereby increasing the chances of extracting more relevant information from the respondents that even the researcher might not think about beforehand.

Interviews are best for extracting the information required for the research, although they can be time consuming because the researcher needs to book an appointment with the participants (Saunders et al., 2007). Interviews can be recorded and can be listened to again during the course of the research in order to extract the maximum information from them

(Yin, 2009). They can be carried out at a time when the respondents are at ease so that they can provide complete information in an open-ended discussion i.e. Further questions can be asked based on the responses obtained.

In this study, the author conducted three case studies that consisted of a total of 27 interviews, which was then extended to six case studies and a total of 40 interviews. The respondents included the top management and owners of all six SMEs, along with the heads of all departments and some employees. The author had to carefully choose the study respondents because including all of them were practically impossible. So, author chose people, who had knowledge from all departments, to have their view because e-procurement affects all departments and to see if some have hidden something or have missed something in their interview. Similarly, too fewer respondents would have created bias because each department or individual interpret or evaluate barriers from a different perspective, have different level of knowledge, have different responsibilities within the process. In short these various respondents within each case were selected to have different point of views regarding every aspect of the process in relation to their managerial and working perspectives. The respondents mainly included head (mostly owners), deputy head, head of IT, head of procurement, head of sale etc. More respondents means varied views regarding same aspect which lead to richness of data in terms of various views and opinions regarding the adoption of e-procurement on them or their department and overall on the organisation as well.

The key aim of the forty interviews in this study was to evaluate the elements of the Gunasekaran and Ngai (2009) model and investigate additional factors that affect the adoption of e-procurement in selected Saudi Arabian SMEs. There are many recommend approaches and styles mentioned in the literature for the effective use of interview tools to collect data for a process or situation. Patton (1987) emphasis that the reliability of results obtained from interviews depends on the effectiveness of the questions prepared and asked in the process of the interview and on the style of the interview (open-ended or closed-ended). Similarly, questions must be framed in such a way that the respondents are not set to close potential replies. The questions must be clear and should not be ambiguous,



because in such scenario, the respondent will be misled and the response will be meaningless (Oppenheim, 1998). The same can be said for questionnaires as well, but the added advantage of interviews is that the respondent can be asked the question again and any ambiguity can be explained to him. Oppenheim (1998) believes that the interpersonal and communication skills of the person conducting the interview are essential for a fruitful outcome. Some of the key and essential skills needed in an interviewer are as follows:

- Must be polite and should be able to praise and instil confidence in the interviewee to open up and respond with confidence;
- Must be able maintain neutrality and build a close bond with the interviewee;
- Must show empathy to the respondents, especially when the situation under consideration is sensitive and the issue is critical for the individual or the organisation.

### **3.11.2 Analysis of Qualitative data**

The qualitative data collected via interview needed a method of analysis and the researcher chose within and cross case study analysis for this purpose so the data can be condensed into analysable chunks. As per Strauss and Corbin (2014), qualitative data can be read carefully line by line to get key concepts from a bigger cluster and thus emergent factors can be found. However according to Gilovich systematic reading and picking can sometime be illusory, chaotic and random, so in order to avoid this author has used “*within case*” and “*cross case*” to carryout affective analysis of qualitative data.

This approach allowed the author to affectively sum up the data collected via interview in an organised and meaningful manner. According to Spardley (1979) this technique of case study analysis is the very affective and beneficial in qualitative research. Within case analysis is used to analyse the data within each of the four selected SMEs and justify it by observation and document review. Cross case analysis was used to compare and find the relevance of each factor across each of the four selected SMEs to compare and contrast them. This approach of case study analysis has been used and advocated by many researchers such as Yin (2009). The detail is provided in chapter 6.

### 3.11.3 Justifying the Use of Case Study Research

From the Information System research literature, it is evident that the case study is a widely-used research strategy, specifically in the context of theory development (Yin, 2009). The case study approach is very common in research in the areas of psychology, sociology, community planning and economics (Ghauri and Gronhaug, 2002). According to Yin (2009), the case study is a comprehensive evaluation of an observable fact in its natural context/surroundings, using various data collection methods from one or many people/groups. Data can be collected via questionnaires, interviews, written material and observations. A case study approach is flexible i.e. it can be very well structured (i.e. a deductive or positivist investigation of many cases), unstructured (i.e. inductive or interpretive of a single case study), or it can be anything in the middle of these two. This means that case study based research can be used in various ways with varied findings and outputs for each case study.

In this research, the case study approach was adopted for exploratory research as it focuses on the question of, 'what factors affect the adoption of e-procurement?'. Such case studies are constructive for theory development because they can provide the basis for future research (Roethlisberger, 1977).

The main rationales for adopting the case study research strategy in the current research are as follows:

- The case study approach is a valuable tool in explaining, extending and understanding the subject i.e. the adoption of e-procurement in Saudi Arabian SMEs (Gary, 2009).
- Case studies are often associated with qualitative studies because they have the added advantage of measuring contemporary phenomenon in real life, especially when there is a very thin line between the phenomenon and its surroundings i.e. context (Yin, 2009).
- Case studies provide an in-depth understanding of the research context and the process that is required to be adopted i.e. e-procurement in this context (Saunders et al., 2007, p.139).

- The case study approach allows for inductive exploratory research with six multiple cases in order to develop the theory (Gary, 2005).
- Case studies can provide strong results when designed properly to challenge the existing theories and literature (Saunders et al., 2007).

#### **3.11.4 Single and Multiple Case Study Research**

Researchers can use single or multiple case studies, depending on the requirements of their research, but the selection is a vital process and depends on the design of the case study. According to Cavaye (1996), single case study is appropriate in research where detailed investigation of a phenomenon is required in a homogenous environment offering illuminating and productive prime data. However, in a complex organisational setup, or where more than one organisation is examined and there is heterogeneity in the environment, multiple case studies are ideal. In this current research scenario, the author has adopted the multiple case study approach as the organisational set ups are different, in terms of complexity, finances and other processes, and a single case study would not generate all the information required for the phenomenon (i.e. the adoption of e-procurement in Saudi Arabian SMEs). Multiple case studies allow greater slippage and sensitivity around the central theme of the study i.e. the adoption of e-procurement in Saudi Arabian SMEs and the research questions (Gray, 2005).

The idea of using multiple case studies in this research is to replicate theories and literature to obtain findings from each of the cases to find new elements in the factors and to establish how they vary from case to case depending on other variables, such as size, finances etc. According to Yin (2009), replication is good because they are all based on a single theoretical foundation and the differences in the findings allow the researcher to have a broader view of the situation. So, in short, multiple case studies help in generalising the situation. Yin (2013) noted that the iteration or replication of single phenomenon based on a single theoretical foundation help in unearthing new findings. This study has used six different cases (the multiple case study approach) to investigate the factors that affect the adoption of e-procurement in Saudi Arabian SMEs.

### **3.12 Summary**

This chapter explains the research method adopted to collect the data required for the research. The researcher followed a triangulation approach where both quantitative and qualitative data were collected to effectively answer the 'how' and 'what' questions of the research. A combination of questionnaires and interviews were used to implement the strategy and approach. Semi-structured interview questions and a questionnaire were prepared after detailed research and brain storming to provide an insight into various aspects of e-procurement adoption in selected Saudi Arabian SMEs. AHP was used to analyse quantitative data and generate statistics based on the data obtained via questionnaires. AHP is pivotal in determining the relative importance of various factors so that due importance can be given to those factors in the adoption of e-procurement. Qualitative data obtained via in-depth interviews helped to provide an insight into various aspects of Saudi Arabian SMEs and the factors that will be important for their adoption of e-procurement. It is most likely that addressing the factors determined via interviews will increase the probability of successful adoption of e-procurement in selected Saudi Arabian SMEs.

## **Chapter Four**

### **4. Individuals' Experiences on e-procurement in Saudi Arabian SMEs: An Exploratory Study**

#### **4.1 Introduction**

The basic aim of an exploratory study is to collect data on a smaller scale in order to gain an understanding about certain issues before conducting a larger-scale study (Yin, 2009). In the RS4 stage, an exploratory study is conducted in order to confirm the suitability of the research tools used, and changes will be made to the instruments before the main study if required (Yin, 2009). Participants interview responses to questions (shown in Appendix A.1) were (fragmented) broken down into smaller statements so as it can be easily analysed and compared with other people responses and also with the responses in Gunasekarn and Ngai(2009) study. Further AHP analysis will be easy to prioritise which of the factor statement is having more importance and relevance in the adoption of e-procurement. The questionnaire used in the exploratory study (Appendix A.1) was more focused on the current status and readiness of Saudi Arabian SMEs which was enhanced further and included questions on all other elements of the model as shown in (appendix G. 1).

Based on the participants' responses, three case studies will be established. These case studies will then be reviewed and supported through literature review.

## **4.2 Objectives of the Exploratory Study**

This exploratory study is aimed to get an insight into the knowledge and understanding of people in selected Saudi Arabian SMEs about e-procurement. Specific objectives of Pilot study are as follows

- To examine the understanding and knowledge of study participants about e-procurement
- to understand the current status and readiness of selected Saudi Arabian SMEs
- To get an idea into the potential barriers, critical success factors and benefits of e-procurement within selected Saudi Arabian SMEs
- Identify and analyse various type of procurement documents
- To understand and analyse the importance of e-procurement and IT for the future performance of selected Saudi Arabian SMEs

## **4.3 Research Methodology of the Exploratory Study**

Data for exploratory study was collected from three selected SMEs namely Ahmed Bamaroof (Ahmed Bamaroof), Al-Maram and Khatib & Alami (KA). In total 27 interviews were conducted, recorded and transcribed. The interview responses were instrumental clarifying various e-procurement related questions in the context of Saudi Arabian SMEs. From Ahmed Bamaroof 12 people namely the director, deputy director, head of IT and 2 other IT department employees, head of accounts and his assistant, Head of marketing and his assistant were interviewed. Ten (10) people including the head of the company, the director of procurement department and his deputy, head of finance department and an employee, head of HR, head of IT and three other employees from the department were interviewed. Five people were interviewed from Al-Maram including the CEO, head of procurement, head of IT and head of finance. All companies head less than 100 employees with Ahmed-Bamaroof having between 90 and 95, Khatib and Alami 60 to 80 and Al-Maram 30 employees which as per our definition of SMEs qualify them all as SMEs (RCC, 2003). The interviews were a combination of structured and semi-structured questions. The responses were recorded, analysed and tabulated as shown in table 4.2. (Also published in my article

in ATINER's Conference Paper Series CBC2014-1332, "An Investigation into the Factors affecting Adoption of E-procurement in Saudi Arabian SMEs (An evaluation of Gunasekaran and Ngai et al, 2009 Model)", dated 19/1/2015 )

<b>Company</b>	<b>Number of respondents</b>
<b>Al-Maram</b>	<b>5</b>
<b>KA</b>	<b>10</b>
<b>Ahmed Bamarroof</b>	<b>12</b>
<b>Total</b>	<b>27</b>

Table 4.1: Total numbers of respondents from each company

#### **4.4 Data Analysis and Discussion**

##### **4.4.1 Current status and readiness of Saudi SMEs for e-procurement adoption**

In response to question on current status and readiness for e-procurement by the SMEs and activities being conducted e.g. the presence of a website and information published on it, the following were noted. (Also published in my article in ATINER's Conference Paper Series CBC2014-1332, "An Investigation into the Factors affecting Adoption of E-procurement in Saudi Arabian SMEs (An evaluation of Gunasekaran and Ngai et al, 2009 Model)", dated 19/1/2015 )

Interview statement	SaudiSuzoki	KA	Al-Maram
Q1/No, don't have website	0/12 (0%)	0/10(0%)	5/5(100%)
Q1/Yes, have website	12/12(100%)	10/10(100%)	0/5(0%)
Q1/Information about company	11/12(91%)	9/10(90%)	0/5(0%)
Q1/Information about products or services	10/12(83%)	8/10(80%)	0/5(0%)
Q1/Reference materials for potential customers	7/12(58%)	0/10(0%)	0/5(0%)
Q4/Don't have	12/12(100%)	10/10(100%)	5/5(100%)
Q5/ Don't have	12/12(100%)	10/10(100%)	5/5(100%)
Q7/3 people are involved in the procurement process	12/12(100%)		
Q7/2 people are involved in the procurement process		10/10(100%)	
Q7/1 person is involved in the procurement process			5/5(100%)
Q9/Internet	12/12(100%)	10/10(100%)	5/5(100%)
Q9/E-mail	12/12(100%)	10/10(100%)	5/5(100%)
Q9/Fax	2/12(16%)	1/10(10%)	3/5(60%)
Q9/Phone	2/12(16%)	2/10(20%)	4/5(80%)

**Table 4.2: Responses on Current Status and Readiness of Companies**

The analysis of above data reveals that Ahmed Bamaroof(Ahmed Bamaroof) and KA are relatively better at current status and readiness for the adoption of e-procurement as compare to the third SME because they both have websites as well as qualified staff needed for the adoption of e-procurement. However comparing the results with Gunasekaran and Ngai et al (2009) study it can be deduced that Saudi SMEs are behind in terms of their current status and readiness for the adoption of e-procurement because they haven't adopted any e-commerce model while in their study at southeast cost 41%of SMEs had adopted B2B model and they were buying and selling through their website. In current case only 66%of SMEs have a website while in the case of Gunasekaran and Ngai(2009) 72% of the companies had website. In case of Gunasekarn and Ngai study the SMEs wereactually involved in online buying and selling (14%) while in current case the website is only an interface for customers to see company product related information and no online buying and selling takes place. In case of Gunasekaran and Ngai et al (2009) 6% of total employees were involved in procurement related activities and the number is half in current case with 3% employees involved in the procurement process.

#### **4.4.2 Perceived benefits of the adoption e-procurement**

In response to the question of e-procurement importance for the business all of the respondents (100%) across the three selected SMEs had a considered opinion that it is vital for the growth and extension of the business in current age and time. Majority of the respondents believed that it will allow their business to operate 24/7 and make efficient



utilisation of time and reduction in cost. A close analysis further reveals that these benefits are more evident in case of Ahmed Bamaroof and KA with more technological knowledge, resources and qualified staff and less in case of Al-Maram with lessen resources and qualified staff. The detail is shown in the table 4.3. (Also published in my article in ATINER's Conference Paper Series CBC2014-1332, "An Investigation into the Factors affecting Adoption of E-procurement in Saudi Arabian SMEs (An evaluation of Gunasekaran and Ngai et al, 2009 Model)", dated 19/1/2015 )

<b>Interview statement</b>	<b>Saudi Suzuki</b>	<b>KA</b>	<b>Al-Maram</b>
Q2/It is very important.	12/12(100%)	10/10(100%)	5/5(100%)
Q2/It supports the business environment and it is difficult to work without it.	12/12(100%)	10/10(100%)	5/5(100%)
Q2/It allows the company to operate 24/7.	9/12(75%)	8/10(80%)	2/5(24%)
Q3/It leads to a reduction in processing time.	11/12(91%)	9/10(90%)	4/5(80%)
Q3/It leads to a reduction in transactional costs.	11/12(91%)	9/10(90%)	4/5(80%)

**Table 4.3: Responses on Perceived Benefits of Companies**

Unlike gunasekaran and Ngai et al(2009) where 31% respondents believed that internet is not important for the business in our case all respondents (100%) considered it vital for the growth and production of the company. Since all three companies were operating in different sectors gives us an indication that internet is equally important regardless of the type of business.

#### 4.4.3 Perceived to e-procurement adoption barriers

Interview respondents were well aware of the barriers to the adoption of e-procurement in selected Saudi Arabian SMEs. They mentioned quite a few barriers however, flaws in legal system, lack of transparency, business culture and weaknesses in payment system were the standout barriers mentioned by almost all of the respondents (approx 100%). On Average around 50% of the respondents mentioned some internal barriers such as lack of relevant technological knowledge and skills and top management support as the key barriers to the adoption of e-procurement as mentioned in the table 4.4 below. (Also published in my article in ATINER's Conference Paper Series CBC2014-1332, "An Investigation into the Factors affecting Adoption of E-procurement in Saudi Arabian SMEs (An evaluation of Gunasekaran and Ngai et al, 2009 Model)", dated 19/1/2015 ).

Interview statement	Saudi Suzuki	KA	Al-Maram
Q8/lack of awareness of what can be provided by information technology and e-commerce	6/12(50%)	6/10(60%)	2/5(40%)
Q8/lack of a culture of businesses to change and transparency	12/12(100%)	10/10(100%)	5/5(100%)
Q8/infrastructure for Internet connections or the high cost of access to the internet	11/12(91%)	8/10(80%)	4/5(80%)
Q8/lack of legal and regulatory in the country	12/12(100%)	10/10(100%)	5/5(100%)
Q8/lack of top management support	6/12(50%)	6/10(60%)	2/5(40%)
Q8/lack of use the local language and local content	3/12(25%)	2/10(20%)	2/5(40%)
Q8/lack of skills and knowledge in E-procurement	6/12(50%)	6/10(60%)	2/5(40%)
Q8/lack of payment systems and delivery in country	12/12(100%)	10/10(100%)	5/5(100%)
Q8/cultural resistance to use of e-commerce in Saudi Arabia	12/12(100%)	10/10(100%)	5/5(100%)

Table 4.4: Responses on Perceived Barriers of Companies

A closer analysis of data reveals that most barriers are external which are beyond the control of SMEs and some are internal barriers which are unlike Gunasekaran and Ngai et al (2009) where the internal barriers were more pronounced than the external one.

In case of Gunasekaran and Ngai et al (2009) customer satisfaction with current system, lack of financial resources were some of the key internal barriers unlike culture and legal and infrastructural challenges that could affect the adoption of e-procurement. Similarly in current case 50% of people believed that they lack the skills needed for the adoption of e-procurement while in Gunasekaran and Ngai case only 19% respondents mentioned as such.

#### 4.4.4 Critical success factors for the adoption e-procurement systems

A lot of different factors were mentioned by the interview respondents that can be deemed critical for the adoption of e-procurement in selected Saudi Arabian SMEs e.g the availability of accurate and timely information and delivery of products and services. More than 80% of respondents from Saudi Suzuki and KA mentioned that top management support is vital for their adoption of innovation and more than 50% mentioned that support and collaboration of suppliers and their willingness to use the innovative technology is also very important. Similarly customer's satisfaction, industry related information and use of the technology by competing firms were also found critical for the adoption of e-procurement. Details are given in the table below. (Also published in my article in ATINER's Conference Paper Series CBC2014-1332, "An Investigation into the Factors affecting Adoption of E-procurement in Saudi Arabian SMEs (An evaluation of Gunasekaran and Ngai et al, 2009 Model)", dated 19/1/2015 ).

Interview statement regarding CSFs	SaudiSuzuki	KA	Al-Maram
Q1/There is industry-related information.	8/12(66%)	3/10(30%)	0/5(0%)
Q2/It allows the company to collaborate its internal information with information on the website	8/12(66%)	7(70%)	0/5(0%)
Q2/It is an efficient way to communicate with a large number of suppliers and customers.	10/12(83%)	8/10(80%)	4/5(80%)
Q2/It allows the business to provide in depth and timely information about the products and services.	11/12(91%)	8/10(80%)	3/5(11%)
Q3/It provides an ideal platform for organisation to get and give feed back to suppliers about several of its products.	7/12(58%)	7/10(70%)	2/5(40%)
Q3/ There is top management involvement and support.	10/12(83%)	9/10(90%)	4/5(80%)

**Table 4.5: Responses on Critical Success Factors for e-procurement adoption**

The analysis of results in table 4.5 is mostly in line with Gunasekaran and Ngai et al (2009) study with the exception of communication with other stakeholders.

#### 4.4.5 Perceived future organisational performance and the adoption of e-procurement

In response to the questions on the impact of e-procurement adoption on organisational short and long term future performance it was noted that reduction cost, better utilisation of resources, close collaboration with supplier and customers were some key elements the SMEs thought to achieve in the long run. Similarly the SMEs also believed that more revenue can be generated and the quality of service can be improved with the adoption of e-procurement. People were less certain about the short term impact of e-procurement on their business performance. (Also published in my article in ATINER's Conference Paper Series CBC2014-1332, "An Investigation into the Factors affecting Adoption of E-procurement in Saudi Arabian SMEs (An evaluation of Gunasekaran and Ngai et al, 2009 Model)", dated 19/1/2015 ).

Perceived Organisational Future Performance	SaudiSuzuki	KA	Al-Maram
Q3/Organisation can benefit from process efficiency in both the long and short term.	4/12(33%)	0/10(0%)	0/5(0%)
Q3/Better revenue can be generated.	4/12(33%)	3/10(30%)	0/5(0%)
Q3/ Internet and e-procurement are instrumental in maximizing the quality of service.	0/12(0%)	3/10(30%)	0/5(0%)
Q3/ There is better utilization of resources and cost reduction.	5/12(41%)	4/10(40%)	0/5(0%)
Q3/ There is close networking with other companies.	4/12(33%)	2/10(20%)	0/5(0%)

**Table 4.6: Responses on Perceived Future Organisational Performance**

From the analysis of data it can be found that the performance impact of e-procurement adoption was realised more in the case of Gunasekaran and Ngai et al (2009), probably because some of the SMEs did implement e-procurement and they had empirical evidence to support positive impact on performance.

#### 4.5 Summary

This chapter presents an overview of the exploratory study conducted at the initial stage to test the model and research tools. This initial study justified that proposed model and provided the basis for detailed Quantitative and Qualitative research at the later stage of the research which explored the research topic in in-depth detail.

## **Chapter Five**

# **5. Data Analysis and findings of perceived e-procurement barriers in Saudi Arabian SMEs**

### **5.1 Introduction**

This chapter presents the findings and analysis of quantitative data from selected SMEs using AHP

AHP might not be the best option, but there is sufficient literature to support the use of AHP in the context of similar research, such as the works of Kumar et al. (2010), Salmeron and Herrero (2005) and Chan et al. (1999). Therefore AHP is selected to prioritise the importance of various factors for the adoption of e-procurement in Saudi Arabian SMEs. The research will follow four basic steps to achieve factor priorities for the adoption of e-procurement.

It is worth mentioning that the purpose of AHP analysis is to make a hierarchical comparison as to which element is more important than the other in the Saudi Arabian SMEs context: for example, “business has a website” is different from “type of information a website has” because a business might have a static website built by a web developing company that merely introduces the business and provides contact information. This will have less impact than if a company has a dynamic website that can be updated in-house to provide timely information for customers. This will obviously have a more positive impact on the company’s adoption of e-procurement because they will have skilled people to update, select and manipulate information on e-catalogues, e-bidding etc. as and when needed.

AHP analysis of perceived barriers obtained from study participants is explained as follows

## 5.2 Case1 - Ahmed Bamarroof

AHP analysis of responses obtained from Ahmed Bamarroof reveals inappropriate infrastructure in the country is the biggest barrier to e-procurement adoption. Further lack of Government interest in SMEs and providing them with necessary help, security related concerns, scarcity of skilled human resources were some other key barriers to the adoption of e-procurement. Complete list of barriers and their relative importance with consistency ratio is shown in table 5.1.

NO	Participants	LKS	LAI	TMS	LT	LFR	LISG	FCN	IT	IES	IFS	SC	CI	CR
1	HC1	10.80%	17.40%	2.60%	5.70%	4.60%	15.60%	7.50%	8.30%	8.00%	3.80%	12.30%	3.30%	7.60%
2	DAC1	9.70%	20.30%	5.80%	6.40%	3.20%	11.90%	7.50%	7.90%	7.90%	5.90%	9.80%	3.80%	9.10%
3	MAC1	10.30%	18.90%	3.20%	5.60%	3.50%	13.30%	6.40%	9.80%	8.60%	4.40%	11.40%	4.50%	9.20%
4	HPC1	11.10%	16.70%	2.90%	5.10%	3.60%	13.70%	6.70%	10.90%	8.60%	4.50%	11.70%	4.50%	8.60%
5	MPC1	11.00%	14.90%	2.60%	4.90%	3.80%	14.60%	6.60%	9.20%	9.00%	5.50%	12.90%	5.20%	9.10%
6	SMC1	9.70%	16.60%	3.30%	5.50%	3.50%	14.80%	6.40%	8.80%	8.40%	5.40%	12.30%	5.20%	8.80%
7	HITC1	10.10%	16.40%	2.50%	5.10%	3.00%	15.00%	6.50%	9.60%	9.30%	4.70%	13.10%	4.60%	9.60%
8	S1ITC1	7.70%	15.70%	3.00%	5.50%	3.20%	16.70%	6.60%	9.40%	9.40%	4.80%	14.30%	4.20%	7.70%
9	S2ITC1	8.50%	15.70%	3.00%	5.60%	3.30%	16.70%	5.60%	8.70%	8.80%	5.20%	14.40%	4.60%	7.50%
10	HHRC1	10.00%	15.90%	3.00%	5.70%	3.30%	16.80%	5.90%	8.20%	7.20%	5.20%	13.90%	4.80%	6.90%
<b>Average</b>		9.97%	16.90%	3.14%	5.53%	3.60%	14.97%	6.65%	9.01%	8.47%	4.84%	12.58%	4.36%	8.34%
<b>Rank</b>		<b>4</b>	<b>1</b>	<b>12</b>	<b>8</b>	<b>11</b>	<b>2</b>	<b>7</b>	<b>5</b>	<b>6</b>	<b>9</b>	<b>3</b>	<b>10</b>	

**Table 5.1: Important Elements of BR(Ahmed Bamarroof)**

### 5.3 Case2 - KA (Khatib&Alami)

Responses obtained from KA shows that lack of government interest in SMEs and providing them with necessary financial support is the biggest barrier to e-procurement adoption. Similarly inappropriate infrastructure, security concerns, payment options, lack of skilled worker were other key barriers to e-procurement adoption. Other barriers and their relative importance are listed in table 5.2. A consistency ration of 8.4 shows that respondents were consistent in their response and is a true picture of the barriers in these SMEs.

Participants	LKS	LAI	TMS	LT	LFR	LISG	FCN	IT	IES	IFS	SC	CI	CR
HC2	9.50%	13.70%	3.00%	5.90%	3.30%	19.30%	5.00%	10.10%	6.80%	7.70%	10.60%	5.10%	9.30%
HPC2	9.80%	14.00%	3.10%	6.00%	3.50%	18.60%	4.70%	11.10%	7.00%	7.20%	10.20%	4.80%	7.90%
SPC2	9.90%	17.20%	3.40%	9.70%	4.30%	13.40%	4.20%	8.60%	6.60%	6.00%	11.60%	5.00%	8.50%
HFC2	9.30%	13.50%	3.40%	9.00%	4.30%	16.20%	4.00%	11.30%	6.40%	6.10%	11.50%	5.20%	9.10%
DHRC2	9.70%	15.90%	3.50%	8.90%	4.30%	12.80%	4.60%	10.50%	6.40%	5.60%	12.30%	5.50%	8.80%
HMC2	8.60%	14.10%	3.50%	6.90%	4.30%	16.50%	5.00%	10.40%	6.10%	7.00%	12.00%	5.60%	8.90%
SMC2	9.80%	14.40%	3.80%	7.50%	4.50%	14.40%	4.60%	10.20%	6.70%	7.90%	10.30%	5.90%	7.00%
HITC2	9.70%	15.40%	3.70%	8.10%	4.40%	12.70%	4.70%	10.10%	6.70%	7.80%	11.30%	5.50%	7.80%
S1ITC2	9.80%	13.50%	4.00%	9.80%	4.30%	15.10%	4.50%	10.40%	6.10%	7.10%	10.10%	5.30%	8.30%
S2ITC2	9.60%	13.50%	4.10%	9.40%	4.00%	15.70%	4.80%	9.90%	5.90%	7.40%	10.40%	5.30%	9.10%
<b>Average</b>	9.57%	14.52%	3.55%	8.12%	4.12%	15.47%	4.61%	10.26%	6.47%	6.98%	11.03%	5.32%	8.47%
<b>Rank</b>	5	2	12	6	11	1	10	4	8	7	3	9	

**Table 5.2: Important Elements of BR(KA)**

## 5.4 Case3 - Al-Maram

Responses of participants from Al-Maram show that lack of financial resources is the most important barrier to their adoption of e-procurement which is obvious due to their smaller size and small capital. Lack of government support, lack of skilled and qualified human resources were the most important barrier mentioned by participants for the SME adoption of e-procurement. Other barriers were similar to the aforementioned SMEs with slight variation in priorities as shown in table 5.3 with a consistency of 8.8 .

Participants	LKS	LAI	TMS	LT	LFR	LISG	FCN	IT	IES	IFS	SC	CI	CR
<b>HC3</b>	12.30%	7.40%	3.20%	7.20%	16.40%	13.50%	3.60%	6.10%	4.10%	6.80%	10.30%	9.20%	<b>9.00%</b>
<b>PMC3</b>	11.20%	8.50%	3.20%	7.00%	15.60%	14.20%	3.90%	6.30%	4.60%	6.70%	10.90%	7.90%	<b>9.70%</b>
<b>HMC3</b>	11.70%	8.20%	3.20%	7.60%	14.20%	13.50%	3.80%	6.30%	4.60%	7.10%	8.80%	11.00%	<b>9.9%</b>
<b>AMC3</b>	11.60%	7.60%	3.70%	7.10%	14.60%	12.90%	4.40%	7.40%	4.80%	7.40%	8.30%	10.00%	<b>7.90%</b>
<b>DHRC3</b>	12.60%	7.90%	3.50%	7.70%	15.90%	13.60%	3.60%	5.80%	3.90%	7.20%	8.10%	10.20%	<b>9.60%</b>
<b>SMC3</b>	12.90%	7.70%	3.50%	6.70%	15.60%	13.80%	3.80%	5.30%	4.10%	6.60%	9.10%	10.90%	<b>8.10%</b>
<b>Average</b>	12.09%	7.81%	3.36%	7.21%	15.53%	13.57%	3.81%	6.19%	4.31%	6.94%	9.40%	9.77%	<b>8.88%</b>
<b>Rank</b>	3	6	12	7	1	2	11	9	10	8	5	4	

**Table 5.3: Important Elements of BR(Al-Maram)**

## 5.5 Case4 – Al-Amazon

Similar to Al-Maram, Al-amazon respondents also termed lack of financial resources and lack of Government support as the two most important barriers to their adoption of e-procurement. Remaining barriers with their relative importance and consistency ratio is shown in the table below.

Participants	LKS	LAI	TMS	LT	LFR	LISG	FCN	IT	IES	IFS	SC	CI	CR
<b>HC4</b>	12.70%	7.70%	3.00%	6.30%	16.10%	13.70%	3.60%	5.10%	3.90%	6.00%	9.50%	12.40%	9.00%
<b>PSC4</b>	12.60%	7.50%	3.00%	6.20%	14.20%	15.70%	3.80%	5.10%	3.90%	5.60%	9.80%	12.70%	9.50%
<b>MSC4</b>	11.40%	8.40%	3.00%	6.00%	15.50%	14.90%	3.50%	4.60%	3.70%	5.50%	10.00%	13.40%	9.60%
<b>AMC4</b>	11.60%	8.50%	3.00%	6.00%	15.80%	13.50%	3.40%	4.50%	3.80%	5.60%	10.10%	14.40%	8.50%
<b>SMC4</b>	12.50%	9.20%	3.30%	7.00%	15.80%	13.50%	3.40%	4.60%	4.10%	5.80%	9.90%	10.90%	8.10%
<b>Average</b>	12.25%	8.17%	3.05%	6.30%	15.58%	14.17%	3.55%	4.83%	3.88%	5.75%	9.80%	12.70%	8.95%
<b>Rank</b>	4	6	12	7	1	2	11	9	10	8	5	3	

**Table 5.4: Important Elements of BR(AL-Amazon)**



## 5.6 Case 5:NWWC

This company uses Oracle's PeopleSoft E-Procurement for integrating their sales, HR, finance and procurement processes and the respondents were well aware of how the system works and the advantages it offers to the business. Their responses to the perceived barriers of e-procurement are as follows

Participants	LKS	LAI	TMS	LT	LFR	LISG	FCN	IT	IES	IFS	SC	CI	CR
<b>HC5</b>	5.0%	14.9%	3.5%	9.4%	3.9%	15.8%	7.2%	6.9%	10.5%	5.5%	12.6%	4.8%	8.0%
<b>PSC5</b>	5.3%	16.4%	3.4%	9.0%	2.8%	17.9%	7.4%	7.1%	8.6%	4.5%	13.4%	4.2%	7.0%
<b>Average</b>	5.15%	15.65%	3.45%	9.20%	3.35%	16.85%	7.30%	7.00%	9.55%	5.00%	13.00%	4.50%	7.50%
<b>Rank</b>	8	2	11	5	12	1	6	7	4	9	3	10	

**Table 5.5: Important Elements of BR (NWWC)**

From the responses it is evident that due to sound financial position of SME and IT skilled work force, the top ranked barriers are the external barriers i.e. Government lack of support, inappropriate infrastructure and weaker security of the communication lines with a percentage priority of 16.85%, 15.65% and 13%. The fourth important barrier for this company was the incompatibility of the software with its ERP system which is obvious because due to scarcity of skilled people in the country organisation mostly rely on old softwares which the people are used to and the company has to replace them as they were all outdated or incompatible with Oracle people soft. Lack of trust is the next important barrier which also associated with lack of awareness and education in the country. Due to a very good financial position Cost of implementation which wasn't a big issue for the company although it was relative high due to the fact that most existing software and hardware had to be replaced by being incompatible. Due to Good reputation of the company and financial position in the market, public and private financial institutes were willing to provide them with appropriate loans and this wasn't a big issue for the company as well.

## 5.7 Case 6:IUT

Unlike the other companies this company had a SAP ERP system in place for business intelligence to get and respond to customer queries, obtain fast integrated business processes, improve assets and resource utilisation for optimised customer satisfaction and allow employees to carry out various sales and marketing activities. The company in addition to procurement uses the software to streamline and integrate sales, procurement, finance and hr etc. The respondents had a practical experience and were well aware of the advantages of the system. In response to the perceived e-procurement barriers, they responded as follows

Participants	LKS	LAI	TMS	LT	LFR	LISG	FCN	IT	IES	IFS	SC	CI	CR
<b>HC6</b>	5.0%	15.7%	4.5%	11.2%	4.0%	18.0%	4.9%	7.2%	5.9%	9.2%	10.7%	4.0%	4.4%
<b>PSC6</b>	5.0%	15.5%	3.5%	9.3%	4.0%	17.4%	6.8%	7.4%	5.9%	8.1%	12.5%	4.4%	6.7%
<b>Average</b>	5.00%	15.60%	4.00%	10.25%	4.00%	17.70%	5.85%	7.30%	5.90%	8.65%	11.60%	4.20%	5.55%
<b>Rank</b>	9	2	11	4	11	1	8	6	7	5	3	10	

**Table 5.6: Important Elements of BR(NWWC)**

The top three most important barriers for the company's adoption were same as company 5 (NWWC) i.e. lack of Government support, inappropriate infrastructure and security concern which as stated in case 5 are all external and beyond the control of the SMEs and have a percentage priority of 17.7%, 15.60% and 11.60% respectively. Due to good reputation and renew, cost of e-procurement implementation wasn't a big issue for the company which was made further easy by the company's association with Jindal group and by being its major supplier which has already implemented the same software. Simiallry the good reputation of the company also means that government and other financial instituates were willing to provide them necess fundings. Since the company had a long association with jindal group of India and had been using updated software that were used by the jindal group,there were less incompatibility issues with existing software of the compny or its supplier as were found in case 5.

## 5.8 Overall Average Priority of Perceived Barriers Across All SMEs and (CR)

Overall analysis of data obtained from across the four selected SMEs is shown in table 5.16.

Factors	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Average	Rank
Lack of knowledge and skills	9.97%	9.57%	12.09%	12.25%	5.00%	5.00%	8.98%	4
Lack of appropriate infrastructure	16.90%	14.52%	7.81%	8.17%	15.60%	15.60%	13.10%	2
Top management attitude	3.14%	3.55%	3.36%	3.05%	4.00%	3.45%	3.43%	13
Lack of trust	5.53%	8.12%	7.21%	6.30%	10.25%	9.20%	7.77%	6
Lack of financial resources	3.60%	4.12%	15.53%	15.58%	4.00%	3.35%	7.70%	7
Lack of interest or support from Government	14.97%	15.47%	13.57%	14.17%	17.70%	16.85%	15.46%	1
Fear of change into a new system	6.65%	4.61%	3.81%	3.55%	5.85%	7.30%	5.30%	12
Immaturity of technology	9.01%	10.26%	6.19%	4.83%	7.30%	7.00%	7.43%	8
Incompatibility with ERP Systems	8.47%	6.47%	4.31%	3.88%	8.65%	9.55%	6.89%	9
Insufficient financial support	4.84%	6.98%	6.94%	5.75%	5.90%	5.00%	5.90%	11
Security concerns	12.58%	11.03%	9.40%	9.80%	11.60%	13.00%	11.24%	3
Cost of Implement	4.36%	5.32%	9.77%	12.70%	4.20%	4.50%	6.81%	10
CR	8.34%	8.47%	8.88%	8.95%	5.55%	7.50%	7.95%	5

**Table 5.7: Overall Average Priority of Perceived Barriers Across all SMEs and Consistency Rate (CR)**

From the data it is clear that since every organisation's adoption of technology depends on the telecommunication and internet infrastructure, online payment options, delivery system and IT skilled staff and all these things are linked directly or indirectly to Government. Implementing an unbiased and internationally consistent online business laws and regulations are also the responsibility of the government. Further due to lack of finances and fundings, SMEs rely on government help and support with easy and flexible terms and conditions. Keeping all these in mind Lack of Government support is obviously the biggest barrier and is rightly evident from the respondent's data in table 5.16 being the top ranked barrier with a percentage priority of approx 15.46%. The 2nd barrier is also related to the government directly or indirectly via private sector i.e lack of appropriate infrastructure with a percentage priority of 13.10%. The third most important barrier is security concern with a percentage priority of 11.24% which is obvious because there has been many cases of online fraud even in the developed world and due to weaker infrastructure and lack of proper regulation it becomes more pronounced and SMEs due to their lack of financial resources

can't afford their money to be stolen or customers affected financially or breaches in their private details. Although from the interview statements and country profile in the background section, it is evident that the government has invested a lot in the IT education but it will take a few years before the local skilled workforce is available in the market. As of now majority of SMEs rely on expatriates for managing the IT section which cost them a lot and is rightly ranked 4th important barrier with a percentage priority of 8.98%. The average priority of other barrier is shown in table 5.7. One key thing to be noted from the data is that the top management in these selected SMEs have a positive attitude towards the adoption of technology i.e e-procurement etc and is thus an encouraging sign for Saudi Arabain SMEs.

Thus if Government provide necessary fundings, improve infrastructure, increase awareness and insure appriate security measures and legislations these SMEs will quickly adopt e-procurement.

## **5.9 Summary**

This chapter has analysed the quantitative data on perceived barriers obtained via a questionnaire completed by respondents from four Saudi SMEs to provide an insight into the relative importance of each barrier elements within each of the six selected Saudi Arabian SMEs using the proposed model (Gunasekran and Ngai, 2009). The analysis reveals that the proposed model is relevant for the adoption of e-procurement in the Saudi Arabian context, although the relative importance of various barrier elements varies slightly from the findings of Gunasekran and Ngai (2009).

# Chapter Six

## 6. Case Studies

### 6.1 Within-Case Studies (Introduction)

The aim of this chapter is to build on the lessons and experiences from the pilot study and analyse the factors affecting the adoption of e-procurement in selected Saudi Arabian SMEs in further detail.

The key objective of this within-case analysis is to build on the output of Gunasekaran and Ngai (2009), the pilot study and broader e-procurement literature research to determine factors that affect the adoption of e-procurement in selected Saudi Arabian SMEs. As discussed by Gilovich (1991), often when something is random, illusory and chaotic, explanationsthat attempt to assign logical meaning miss the mark, and to avoid this, within-case and cross-case analysis has been undertaken.

These analyses will be used to investigate the way in which e-procurement is used within the selected SMEs as well as to gain insight into the five factors of the Gunasekran and Ngai(2009), along with external factors as an additional element in these SMEs. The author investigated NWWC (North West Water Consortium), a medium size company and International Unions for Trading Est, both having excellent financial position, reputation and infrastructure, Ahmed Bamarouf Automotive another a medium-sized company that has relatively good infrastructure and e-procurement tools; Khatib&Alami a medium-sized company as well as Al-Maram) and Al-Amazon small size companies. The cases are developed from quantitative data obtained via questionnaires and qualitative data obtained via semi-structured interviews. Additional sources of data collection include documents and observation of staff meetings and working within these selected SMEs. Each case study is divided into seven sections, starting with a brief description of the context, followed by the relevant data obtained via questionnaires and semi-structured interviews and then developing findings and arguments based on the responses from the participants from each of the four selected SMEs. Each case ends with a section in which the key findings are summarised. Pseudonyms are used for all participants for the sake of their anonymity and

confidentiality, as per the ethical code of practice for the research. The companies' names are real, as they have granted permission to use them. The participants' names and positions are coded for the sake of reference to their responses in this research.

A summary of the work undertaken for the four case studies is as follows

Six selected SMEs, namely NWWC (North West Water Consortium) , International Unions for Trading Est, Ahmed Bamarouf KA (Khalif & Alami), Al-Maram and Al-Amazon, were studied and analysed thoroughly and the following fieldwork was carried out within all six selected SMEs:

- Collection of procurement-related information in the form of word documents, spreadsheets and scanned documents.
- Collection of qualitative data using semi-structured interview questions.
- Collection of quantitative data via questionnaires from respondents within each of the four selected SMEs.

This approach allowed us to submit the data to observation and document review to fulfil the problem of handling information from quantitative (questionnaire) and qualitative (semi-structured interviews) methods in an organised and meaningful manner (Spradley, 1979; Yin, 2009). The benefit of this approach is that qualitative analysis of each individual organisation can be obtained and can then be compared via cross-case analysis for each individual factor of the model.

The output of interviews from across all four selected SMEs (Interview statements: see Appendix G). The objective of these interviews was to:

- Validate and compare the findings of the Gunasekaran and Ngai (2009) model within each of the four selected Saudi Arabian SMEs;
- Investigate additional factors that impact the adoption of e-procurement in four selected Saudi Arabian SMEs;
- Understand elements related to each of the model factors within each of the four selected Saudi Arabian SMEs.

## **6.1.1 Case: 1: Ahmed Bamarouf**

### **6.1.1.1 Introduction (Context of the case study)**

Ahmed Bamarouf automotive was established by Ahmed Bamarouf in 1945 in Jeddah. The company started selling Suzuki products in 1968 in the kingdom of Saudi Arabia. The company can be regarded as a medium-sized enterprise on the basis of the definition provided in this thesis.

The company is well established and popular in Riyadh region of Saudi Arabia and deals in Suzuki cars and its related spare parts. Its customers are based locally in Riyadh and follow traditional ways of business. It procure its products from renowned bigger Suzuki suppliers in the country and sometime from abroad using phone, FAX and some time the internet. It has not yet adopted e-procurement but is we aware of its benefits and would like to adopt it soon. The company has got all the pre-requisit to adopt e-procurement.

In order to gain insight into the usage of e-procurement within the company and identify factors affecting its adoption of e-procurement, the researcher interviewed ten people, including the head of the company, the director of the accounts department, a member of the accounts department, the head of procurement, staff of the procurement department, a staff member from the marketing department, the head of the IT department and three other IT staff members. Questionnaires were also distributed in the company to collect quantitative data regarding various elements of each of the five factors mentioned in the Gunasekaran and Ngai (2009) model.

### 6.1.1.1.1 Current Status and Readiness

In relation to current status and readiness, the analysis of quantitative data obtained via questionnaire regarding five key elements in Ahmed Bamaroof (i.e. regular use of the internet in business, business has a website, qualified IT staff, current e-commerce model and use of technology in the procurement process) is shown in Table 6.1, below.

Factors	Average	Rank	Consistency ratio (CR)
Using internet regularly in business	10.54%	4	7.08%
Business has a Website	21.96%	2	
Qualified IT staff	9.25%	5	
Current E-commerce model	16.80%	3	
Use of technology in procurement process	40.65%	1	

**Table 6.1: Current Status and Readiness for the Adoption of e-procurement in Ahmed Bamaroof**

As can be seen, the company makes good use of technology and gives it high priority, with a percentage ratio of 40%. Several types of computer software, such as databases, an ERP system, accounting and others, are used. The company has developed and maintained a website where it displays all its products and prices and can get feedback and queries from customers. As can also be seen in Table 7.1, the presence of the website has been given higher importance (21.96%) for the company's adoption of e-procurement and is expected to be highly valuable in terms of the company's qualification for this adoption. The company is following a basic e-commerce model (EDI), which is the third most important factor for its future qualification of e-procurement. The company has hired well qualified staff (most of whom are expatriates) despite the lack of qualified IT staff in the market. As is evident from the figures, hiring qualified staff has never been an issue for this company because it has the sales and finances to pay them, unlike other SMEs, which struggle to pay high wages to qualified staff, and this factor is thus not as important as the other elements. The results are very consistent, with a consistency ratio of 7.08%, i.e. 0.7 (less than 10).

Further, from these figures, it is evident that the company qualifies for a basic level of e-procurement adoption because it uses EDI for data exchange and communication with various stakeholders and regularly uses the internet for procurement-related activities (Gunasekaran and Ngai, 2008; Azadegan and Teich, 2010). Veit et al. (2011) believe that SMEs that are accustomed to electronic data exchange and use of the internet in their



business activities demonstrate a basic level of readiness for innovation and adoption of e-procurement because not much more is required in this regard.

The importance of these factors in weighing the current status and readiness were elaborated by the interview responses. Talking about the most important factor, i.e. the use of technology in the company, the head of procurement (HPC1) stated that:

*“We currently use EDI to communicate with customers and suppliers, giving them guidance and advice and also obtaining the same from suppliers.”*

However, they were aware that the use of EDI Technology is important but is only an initial stage in e-procurement adoption and more work is required in order to fully qualify for the adoption of e-procurement. The head of the company thus stated that:

*“EDI is an initial stage in e-procurement and indicates that organisations are a long way away from adopting web-based e-procurement.”*

Similarly, talking about the importance of the company having a website and its relationship to e-procurement adoption, the head of the company stated:

*“We have a website where we do electronic data exchange (EDI) with customers and suppliers, giving them guidance and advice and also obtaining the same from suppliers.”*

Similar responses were noted regarding the importance of other factors in relation to current status and readiness of the company for the adoption of e-procurement.

From this, it can be stated that Ahmed Bamarouf qualifies for a basic level of readiness, as the firm uses EDI, has a website and has adopted the B2B and B2C model of e-commerce.

#### **6.1.1.1.2 Perceived Benefits**

With regard to the perceived benefits of e-procurement in Ahmed Bamarouf (Ahmed Bamarouf), the analysis of quantitative data obtained via questionnaire regarding fourteen elements (i.e. better utilization of staff, efficiencies increment, help to improve SCM,

improve existing markets, improve relationships with supplier, improve customer service levels, increase customer satisfaction, increase market share, reduction in inventory levels, reduction in non-contractual buying, reduction in operational tasks reduction in processing time, reduction in transactional cost and support environmental issues) is shown in Table 6.2 below. The table has been submitted as a part of Author’s publication in “The GAI International Academic Conference Proceedings Istanbul, Turkey”, under the Title “Evaluation and Investigation into the Potential Benefits of e-Procurement Adoption in Saudi Arabian SMEs” in 2015).

Factors	Average	Rank	Consistency ratio (CR)
Better utilization of staff	6.85%	7	7.75%
Efficiencies increment	3.52%	13	
Helps to improve SCM	13.41%	1	
Improved existing markets	9.22%	4	
Improved relationships with supplier	12.15%	3	
Improved customer service levels	6.78%	8	
Increased customer satisfaction	5.81%	9	
Increased market share	4.26%	10	
Reduction in inventory levels	7.49%	6	
Reduction in non-contractual buying	4.18%	11	
Reduction in operational tasks	3.55%	12	
Reduction in processing time	8.44%	5	
Reduction in transactional cost	12.47%	2	
Support environmental issues	1.88%	14	

**Table 6.2: Perceived Benefits of E-procurement Adoption in Ahmed Bamaroof**

As can be seen in the table, the ability of e-procurement to improve supply chain management has been ranked highest, with a percentage ratio of 13.41%, which shows the awareness and knowledge of company staff regarding the purpose of e-procurement adoption. Similarly, the company is aware that money can be saved in transactions because orders can be placed and tracked and multiple people in the company and on the supplier side will be aware of the order status and can ensure that it reaches its destination on time: thus, reduction in transaction costs and improvement in relationship with suppliers are ranked second and third, with percentage ratios 12.47% and 12.415% respectively. The average priority of other factors is shown in Table 7.2. Support for environmental issues, although it is ranked the lowest, shows that the company cares about the environment and is aware of its corporate social responsibility.

It can therefore be deduced that there is good awareness about the benefits of e-procurement in Ahmed Bamaroo and the results are comparable with Gunasekaran and Ngai's (2009) findings, with some benefits being realised to a greater extent than others. From Eei(2012) and Gunasekaran and Ngai(2009), one can easily conclude that although the SME is yet to adopt e-procurement, it has realised the benefits, which is a very positive sign for its future adoption of e-procurement.

This is further evident from the interview statements of study participants from the SME, who were aware of the benefits not only for the company in the future but also for its future impact on the industry. For example, the head of the company, while discussing the benefits of e-procurement, stated that:

*“Traditional businesses have a very limited local supplier base, while e-procurement allows businesses to have a wider supplier base and they can thus choose a supplier with the best product or service at the lowest possible price. This allows a business to increase its profit margin and also to offer products at lower prices to its customers, thereby obtaining competitive advantage over other SMEs.”*

This is in line with the findings of Change et al. (2010), who stated that e-procurement allows companies to find new sellers who are selling the same product but of a better quality, and sometimes of the same quality with reduced price, thereby giving the company a competitive edge. Renna and Argoneto (2010) have also found that e-procurement increases business opportunities for SMEs, allowing them to escape from the monopoly of local suppliers and find better deals elsewhere. Walker and Brammer (2012) and Pereira (2009) also mentioned that e-procurement allows businesses to expand their supplier base as well as their customer base, thereby providing competitive edge to the business.

Further, the analysis revealed that e-procurement can improve the relationship of businesses with suppliers and partners. This factor was mentioned by only a few interview participants and not the majority of them, which might be because it is not a direct benefit for the firm (Teo et al., 2009; Chau and Hu, 2001). Some of the characteristics of e-

procurement that lead to improved relationships with suppliers were mentioned in an interview statement from the head of Ahmed Bamaroof (HC1), who was quoted as follows:

*“E-procurement provides a great opportunity for the SMEs to improve relationships with suppliers by making sure that there is greater transparency and visibility and fewer errors or delays in order of products which further make the business work with the same accuracy with its customers and other partners and overall business trust and integrity increases.”*

From the interview responses, it was also found that innovative technology such as e-procurement positively impacts the working practices of an organisation. The majority of respondents stated that e-procurement benefits individual staff as well as overall organisation efficiency, increases transparency and overcomes inefficiency and corrupt practices.

The head of the procurement department stated that:

*“E-procurement not only increases transparency within the organisation but also discourages injustice and inefficiency. It also gives rise to practices that are consistent internationally and thus helps the organisation in expanding itself by taking benefits from those working patterns.”*

Increased transparency in firms’ processing was also highlighted by the interview participants. As an example, the Director of Accounting department in Ahmed Bamaroof was quoted as saying:

*“E-procurement can improve transparency by reducing collusion among bidders and eradicating corruption by making bidding information visible to a wider pool of interested suppliers. Participation of a large number of firms will break the monopoly of local firms. Corruption can be mitigated by stopping information withholding by government officials and other people and making it clearly visible to all parties.”*

E-procurement’s ability to bring transparency to firms’ supply chain has gained wide acceptance in the e-procurement literature. Anderson (2009) stated that e-procurement

allows for transparency in bidding. Similarly, Betrot et al. (2010) found that e-procurement eliminates collusive bidding and corruption and ensures greater transparency in the supply chain, which they also regard as a relationship-strengthening factor between the supplier and the firm. Mahmood (2010) and Kaliannan et al. (2009) found that e-procurement overcomes the inherent weaknesses of lesser negotiation and transparency in traditional procurement systems and leads to greater transparency. Gordon (2009) understands that greater transparency achieved via e-procurement adoption leads to better and more factual pricing and reduced transaction timings.

In short, e-procurement leads to a culture which is highly beneficial for the growth and expansion of an organisation: i.e. it brings transparency, which increases the organisation’s chance of growth in the current highly competitive business world.

Other study participants’ views also showed that they not only have a realisation of the benefits of e-procurement but also have adequate knowledge about the new industry trends in this regard and a future vision on the adoption and benefits of e-procurement.

### 6.1.1.1.3 Perceived Barriers

The analysis of data related to perceived barriers elements obtained from study participants from Ahmed Bamarouf (Ahmed Bamarouf) is shown in the table below. The elements have been ranked based on their relative priority score as shown in table 6.3. As is evident from a CR score of 8.34, the respondents were consistent in their response.

Factors	Average	Rank	Consistency ratio (CR)
Lack of Knowledge and Skills	9.97%	4	8.34%
Lack of appropriate infrastructure	16.90%	1	
Top management attitude	3.14%	12	
Lack of lack of trust	5.53%	8	
Lack of financial resources	3.60%	11	
Lack of interest or support from Government	14.97%	2	
Fear of change to a new system	6.65%	7	
Immaturity of Technology	9.01%	5	
Incompatibility with ERP Systems	8.47%	6	

Insufficient financial support	4.84%	9	
Security concerns	12.58%	3	
Cost of Implement	4.36%	10	

**Table 6.3 Perceived Barriers to E-procurement Adoption in Ahmed Bamarouf**

Further from the analysis it can be deduced that Lack of support from government, weaker infrastructure and security issues are the top barriers with relatively higher priorities, and they are all beyond the SMEs control while internal barriers such as top management support, implementation cost have comparatively lower priority which shows that SMEs on their own are willing to adopt e-procurement once they are provided with appropriate infrastructure and support from the government.

From the interview data obtained from selected SMEs justifies the above findings regarding the barrier of e-procurement adoption. The participants particularly highlighted the barriers with top priority in table 6.3 to be the key hurdles to their adoption of e-procurement. The respondents were very hopeful that once the barriers beyond the SMEs control such as weaknesses in infrastructure, security concerns and lack of Government support are overcome the SMEs will be able to adopt e-procurement. Weaknesses in infrastructure such as slower internet speed is evident from the interview statement of the head of Saudi Suzuk (HC1), who stated that

*“The internet is very slow and needs further improvement to meet the needs of e-procurement.”*

The response can be easily justified from the literature where the speed of internet connection and its availability is considered very important for the adoption and performance of e-procurement solutions e.g. Laryea and Ibem (2014) in their study on e-procurement adoption in South Africa found that 46% of the respondents in their study mentioned internet speed as the key barrier to the adoption and performance of e-procurement. Although the respondents did mention that there are some positive steps by the government in recent times yet there are still parts of the country where the availability and speed of internet is an issue. The head of Ahmed Bamarouf further stated that

*“The infrastructure, including the availability and speed of internet, regulatory framework, e-payments and the availability of IT skilled staff in the country, is at*

*preliminary stage and must be improved to fulfil the needs of e-procurement and other e-commerce solutions.”*

#### 6.1.1.1.4 Critical Success Factors

In relation to critical success factors for the adoption of e-procurement in Ahmed Bamarouf (Ahmed Bamarouf), the analysis of quantitative data obtained via questionnaire regarding fourteen elements (i.e. a comprehensive strategy, technology standards, organisations process re-engineering, user interface, authentication and integration of the new e-procurement, education and training, consent of stakeholders and perform stakeholders, firm’s size, centralized control and management, communication between participants, clear and achievable implementation, clear accountability for buying, close collaboration with suppliers, top management involvement and support and use of prototypes) as shown in Table 6.4 below.

Factors	Average	Rank	Consistency ratio (CR)
A comprehensive strategy	5.99%	8	7.60%
Technology standards	8.40%	5	
Organisations process re-engineering	3.72%	14	
User interface	7.25%	6	
Authentication and integration of the new e-procurement	3.85%	13	
Education and training	8.85%	3	
Consent of stakeholders and perform stakeholders	4.08%	11	
Firm’s size	8.63%	4	
Centralized control and management	4.03%	12	
Communication between participants	7.11%	7	
Clear and achievable implementation	5.23%	9	
Clear accountability for buying	4.39%	10	
Close collaboration with suppliers	12.17%	2	
Top management involvement and support	14.08%	1	
Use of prototype	2.25%	15	

Table 6.4: Critical Success Factors for the Adoption of E-procurement in Ahmed Bamarouf

From these figures, it is evident that top management support is the most critical factor within the company, with an average percentage priority of 14.08%, which is to be expected because in the majority of Saudi Arabian SMEs, the top management are mostly the owners, who make all decisions, and the only people whose support will matter are the suppliers. Understandably, close collaboration with suppliers is the second most important factor, with a percentage priority of 12.17%, because without their collaboration, e-procurement cannot be implemented. Factors such as integration with the current system and re-engineering are ranked lower, with an average percentage priority of 3.85% and 3.72% respectively, because the company has sufficient finances and the system can be implemented as soon as the management is willing.

These facts are complimented by the interview statements of the participants, which show that they have great awareness about the critical factors for the successful adoption of e-procurement. They mentioned quite a few CSF, of which some were more important than others.

The study participants from the SME believed that in the Saudi Arabian context, top management is mostly the owner, who has the final say in everything: therefore, everything requires their consent. The head of the company thus stated that:

*“Actually, top management is mostly including the owners who have a final say in the adoption of any innovation or making any other strategic decision. They must be convinced to invest in e-procurement because it offers a lot of benefits.”*

Analysis of qualitative data further reveals that stakeholder (customer, employee, supplier etc involvement is important for the adoption of e-procurement and this factor was also mentioned by the majority of participants. The role of suppliers was highlighted by most of the participants because they are directly affected, as was mentioned by the head of the procurement department in Ahmed Bamarooof:



*“E-procurement not only affects the organisation and its staff but it equally affects the suppliers and other partners: therefore, involving them in the decision of e-procurement adoption is very important.”*

The e-procurement literature has found a direct relationship between stakeholders' involvement and successful adoption of e-procurement (Clark et al., 2012; Davidson, 2002). Moe and Paivarinta (2013) stated that both understanding and involvement of stockholders is critical for the adoption of e-procurement. They particularly stressed the participation and involvement of suppliers and employees of the organisation. Pand and Sahu(2012) reported that stockholder involvement helps in correctly identifying the requirements of the system and providing relevant information that is necessary for the adoption of e-procurement. In short, stockholders' involvement is critical because their role greatly influences the implementation process of e-procurement.

#### **6.1.1.1.5 Future Organisational Performance**

In relation to the impact of e-procurement adoption on the perceived future organisational performance of Ahmed Bamarouf (Ahmed Bamarouf), the analysis of quantitative data obtained via questionnaire regarding fourteen elements (i.e.improve performance in terms of streamlining performance and reducing cost, e-procurement leads to sharing of information, short-term organizational performance, long-term organizational performance, improved cost performance in organization, organizational competitiveness and organization's revenue increment) is shown in Table 6.5 below

Factors	Average	Rank	Consistency ratio (CR)
Improve performance in terms of streamlining performance and reducing cost	8.60%	5	3.87%
E-procurement leads to sharing of information	7.29%	6	
Short-term organizational performance	7.09%	7	
Long-term organizational performance	20.32%	3	
Improved cost performance in organization	22.43%	1	
Organizational competitiveness	21.11%	2	
Organization's revenue increment	13.21%	4	

Table 6.5: Future Organisational Performance as a Result of e-procurement Adoption in Ahmed Bamaroof

Obviously, any business wants to improve its efficiency, i.e. reduction in cost and improvement in competitiveness and the figures shows that these two factors are ranked the highest, with an average percentage priority of 22.43% and 21.11% respectively. Similarly, it is evident from the figures in Table 6.5 that the fruits of e-procurement will be available in the long term, as initial implementation and running costs are higher, and in the short term, the performance might be degraded at times, although the organisational is aware of and ready for this.

In line with these figures, the interview statements of participants from the company further confirm that they have adequate knowledge about the future of impact of e-procurement adoption on the organisational performance. For example, the head of the company not only mentioned that e-procurement has the potential to reduce cost but also illustrated how that cost can be reduced:

*“E-procurement will improve business-wide communication, i.e. communication with suppliers, customers and other stakeholders. Any changes in order can be quickly communicated and thus its impact on business and its customers can be eradicated or at least minimised. Customer satisfaction and loyalty will increase and also trust with supplier will get strengthen as a result of efficient communication and business will flourish.”*

This factor is widely discussed in the e-procurement literature and studies by Walker et al. (2013), Atkinson (2001), Sadowski al. (2002) Lancioni et al. (2003), Lankford (2004) have all found that e-procurement adoption leads to improved communication with customers and suppliers. Cheraghi et al. (2011), in their recent study, found that e-procurement played a vital role in knowledge sharing and communication with suppliers. Beheshti et al. (2007)

found improved communication with vendors and customers to be a very motivating factor for firms' future performance related to the adoption of e-procurement. Croom and Brandon-Jones (2007) found in their study that 60% of respondents related the adoption of e-procurement to improvement in communication with customers: this was the third highest factor in their study, with a usage rate of 2.72.

Reduction in overall purchasing time and cost was another motivating factor which the interview participants attributed to the future organisational performance of Saudi Arabian SMEs. For example, the head of Ahmed Bamaroof described it in his statement as follows:

*"E-procurement will allow SMEs to select the best supplier not only on the basis of lower product price but also on the basis of product quality, method of delivery and delivery time. Delivery time is critical because it can help in reducing the whole procurement cycle and leads to operational efficiency."*

Previous studies in e-procurement by Atkinson (2001), Lancioniet al. (2003), Yu et al. (2008) and Engstrom et al. (2009) affirm and complement the importance and relevance of this factor to e-procurement and its impact on the future performance of the organisation. Ronchi et al. (2010) found that companies like Nestle, Motorola, Schlumberger and Renault have substantially reduced the cost and time of transactions through e-procurement implementation. Similarly, Dooley et al. (2009) found that e-procurement implementation reduces the number of staff, transaction cost, inventory level and procurement cycle, thereby reducing the overall cost of the organisation.

Another factor identified by the study analysis and mentioned by most of the participants was related to an increase in organisations' competitiveness. The head of the procurement department in Ahmed Bamaroof was quoted as saying:

*"E-procurement will allow us to choose from a wider pool of suppliers and also from a wider pool of products: thus the material quality will be improved, which will help in building existing customers' trust and attracting more customers to keep the business competent."*

Studies by White and Daniel (2004), Driedonks et al. (2005) and Yu (2008) confirm this statement. Gamal (2010) has found that e-procurement minimizes human error, improves staff utilisation, reduces the procurement cycle, improves contract compliance and thus improves the overall competitiveness of the organisation. Quesada et al. (2010) found that e-procurement adoption leads to reduction in processing time and cost incurred and increases revenue through better customer service and satisfaction, resulting in a more competent firm. Yu (2009) also found that e-procurement adoption leads to transaction efficiency and expansion in firms' trading, and thus results in gaining a competitive edge over other firms that have not adopted e-procurement. He further stated that firms can better satisfy and answer customer queries and processes and deliver their orders in time.

The analysis of interview data from participants from selected Saudi Arabian SMEs also revealed that e-procurement leads to strategic alliance and networking, i.e. bringing firms and suppliers together into a network where both become strategically important for each other's success. For example, the head of procurement in Ahmed Bamarooof stated that:

*"E-procurement can be very beneficial in future because it can reduce the overall cost and bring enterprises closer together by binding them electronically into a strategic alliance, which leads to stronger cooperation and success."*

The importance of this factor for future organisational performance and its relevance to e-procurement adoption is confirmed by Knudsen (2003), Ritter et al. (2004), Kar (2009) and Walker et al. (2013). Kar (2009) has found that transparency and accountability in the supply chain through e-procurement adoption leads to new strategic relationships wherein the buyer and supplier depend on each other for their success. Walker et al. (2013) extended this further, stating that e-procurement leads to greater information and knowledge availability about different suppliers and buyers, which benefit everyone in the network and not just specific firms: thus, a wider strategic network is created in the industry.

In response to e-procurement relationships and short-term benefits, a range of different responses were given. Some respondents believed that e-procurement leads to short-term improvement in performance, while others thought that this was not the case: for example, the head of Ahmed Bamarooof stated his opinion regarding short-term benefits as follows:

*“The organisation can get short-term benefits from e-procurement, as it has a better infrastructure and the suppliers are external (outside Saudi) who already have e-procurement system and local customers are getting used to electronic technology too.*

#### **6.1.1.1.6 Culture Factors**

From the interview responses, it was also evident that prevailing organisation culture impacts the adoption of new technologies such as e-procurement. Most respondents believed that an analysis of the social factors and cultural characteristics of the organisation is important because e-procurement and other innovative technology require a specific working culture and behavioural characteristics. For example, the head of Ahmed Bamaroof IT department stated that:

*“The effectiveness of new technology within an organisation is impacted by its prevailing culture or vice versa the organisation culture is impacted by new technology. Therefore it is vital that management and staff are willing to welcome such change.”*

Thus it can be deduced from the discussion that a specific working environment, behavioural characteristics and beliefs are required for the adoption of innovative technology. Also it can be found that Saudi Arabian organisational culture is generally positive in regard to innovative technology if firms are clear about its benefits and if it doesn't affect their core beliefs.

From the interview responses, it is evident that the adoption of innovative technology such as e-procurement is affected by national and organisational cultural inertia. Most of the respondents indicated that cultural characteristics such as language, religion, prevailing working norms, traditions and experiences greatly impact the adoption of e-procurement. The head of Ahmed Bamaroof explained the cultural barrier to e-procurement adoption as follows:

*“There is always a natural resistance to alteration in working patterns which people are used to over the years and the same is the case in our SMEs. This is*

*particularly the key when there is cultural incompatibility such as the language of communication or the use of new technology which people have never used before.”*

The head of the procurement department in Ahmed Bamaroof further explained the scenario as follows:

*“The cultural inertia to e-procurement is relatively high as compared to other business applications because it not only impacts individuals within the organisation but also the suppliers and customers, who also show reluctance.”*

It is evident from this statement that cultural inertia, stemming from prevailing work patterns, language of communication and individual behavioural characteristics, is one of the greatest challenges to the adoption of e-procurement in Saudi Arabian SMEs.

From the above, it is evident that most of the barriers to the adoption of e-procurement in this SME are external; otherwise, it has great ability for the adoption of e-procurement.

Most of the interview respondents understood that understanding the prevailing culture of the organisation is critical for the adoption of e-procurement and affirmed that it has a great impact on the adoption of any innovative technology, such as e-procurement. For example, the head of Ahmed Bamaroof believed that the prevailing culture has a great impact on its adoption of e-procurement and therefore it must be analysed so that mitigating measures can be taken to minimize the impact. He expressed his views as follows:

*“It is very obvious that cultural characteristics of an organisation impact any sort of innovative technology adoption in the organisations. People in the organisation find it hard to change the way they have been working over a long period of time and thus show great resistance to change.”*

The head of the procurement department in Ahmed Bamaroof stated that the impact of culture is more evident and dominant in Saudi Arabian SMEs than in some other developing countries due to people’s greater attachment to religious and social norms:

*“In Saudi Arabia generally people have great attachment to religion and social norms and thus show great resistance to any change that impacts their way of working or social life. Since technology (e-procurement) is developed in the west, some people find it contrary to their social norms and oppose it.”*

He further stated that another key reason for such resistance is the lower levels of technological awareness and education in the country:

*“Although government is investing a lot in technical and technological education, it has not yet reached a point where it can be easily accepted and adopted and because most of the people in the managerial position are not accustomed to it, they prefer to work in traditional manner. However, the situation is gradually changing.”*

So it can be deduced that culture is very critical for the adoption of e-procurement in Saudi Arabian SMEs due to their conservative nature and interpretation of everything in the light of religion and social norms.

Also from the respondents' interview statements; it appears that the degree of future performance of an organisation is closely related to how quickly it brings about changes in the business and working culture of the organisation. If current business and working culture is flexible for innovation, future performance is better and vice versa. For example, the head of the IT department in Ahmed Bamarooof said:

*“To be honest, there is a strong link between the organisation culture and its future performance as a result of e-procurement adoption. An organisation with a flexible culture which encourages empowerment and knowledge management is expected to gain more than one with a conservative culture.”*

Another important cultural factor that is perceived to affect the adoption of e-procurement is the business culture of a country. Many study participants mentioned this in their interviews and understood that it has a vital impact on the SMEs' adoption of e-procurement. This can be confirmed by the interview statement of the head of the procurement department in Ahmed Bamarooof, who believed that it is a key external factor

that acts as an important inhibitor or enabler for e-procurement adoption in Saudi Arabian SMEs:

*"I think one of the most important factors that can have an impact on the adoption of e-procurement is the business and national culture of the country."*

He further added that:

*"Saudi national and business culture have features that will act as inhibitors of e-procurement adoption, such as culture, but there are other features, such as GDP, per capital income and the presence of MNCs, that can have positive impact on the adoption of e-procurement in the Kingdom."*

Another very important point mentioned by the head of the IT department in Ahmed Bamarooof regarding the national environment and demographics of Saudi was regarding the population living in cities, which he considered to be a good enabler of ICT:

*"The majority of Saudi people live in cities (approx 85%), which is good because it is easy for the government to lay the IT infrastructure in cities that is needed for e-procurement and other e-business activities."*

Other interview participants also identified this as an important external factor and described its positive and negative aspects for the adoption of e-procurement in Saudi Arabian SMEs.

#### **6.1.1.1.7 External Factors**

Unlike Gunasekaran and Ngai (2009), the present study found that it is not only internal factors that can potentially impact the adoption of e-procurement in the SMEs, as there are some key external factors that have great impact on the adoption of e-procurement. Key external factors found by the study were Government support, low cost and high speed internet connection and competitors' pressure.

Study participants' interview statements revealed that the external factors are more important for the adoption of e-procurement in the SME than the company's own shortcomings or weaknesses. One of the most important external factors the company



referred to was government support. The head of the company elaborated on this factor as follows:

*“Government has a vital role in SMEs’ adoption of e-procurement in Saudi Arabia. It has role in improving ICT and communication infrastructure (e.g. broadband and mobile communication), making and improving new e-commerce and procurement laws, and incorporating the ICT syllabus in school and colleges.”*

The head of IT in Ahmed Bamaroof also believed that Government is a key external factor that can have a positive or negative impact on SMEs adoption of e-procurement:

*“The role of Government is vital because SMEs often have limited finances and can’t afford expensive ICT tools as well as experts, so they rely greatly on government to provide financial support and ensure the availability of cheaper IT experts in the market to ensure smooth adoption of e-procurement by firms.”*

The interview statements of other study participants, provided in Appendix, reveal that they are aware of the external factors and its impact on the adoption of e-procurement in the company.

#### **6.1.1.2 Summary**

From the discussion, it is evident that in relation to current status and readiness, this company qualifies for the basic level of e-procurement adoption and there is great awareness regarding its benefits. Further, it is evident that there are some barriers to the adoption of e-procurement, but most of them are due to external factors. It is also evident that the company believes that its future performance will be positively affected by the adoption of e-procurement. Further the study found that national and organisational culture are vital factors and affect their adoption of e-procurement.

## **6.1.2 Case 2: KA**

### **6.1.2.1 Introduction (Context of TheCase Study)**

The second case examined in this research is a company called Khatib and Alami. It deals in urban regional planning, engineering and architectural projects, and is famous for reliable project delivery, offering an integrated approach towards its clients. It started its services in the kingdom of Saudi Arabia in 1984 and employs about one hundred technicians and professional personnel. The company has expertise in the recruitment of professional and innovative people who can meet the challenges of changing the developing world while at the same time giving proper consideration to environmental protection and other aspects of social life. The company offer projects that fit into the vision of its clients in terms of money and time. It creates designs, supervises and manages projects that have the potential to benefit society. K&A's services are all in-house, covering a broad spectrum of disciplines from architecture to urban transportation, energy, water, and oil & gas projects

KA is a relatively bigger firm with good financial position and has qualified and skilled IT staff. It is very popular in the region and has earned good reputation and awards for its engineering, architecturl, infrastructural and GSI work. Although, the company hasn't adopted e-procurment yet, but it has got all the credentials to adopt e-procurment. Currently it procures its products using, phone, FAX and sometime internet.

### 6.1.2.1.1 Current Status and Readiness

With regard to the current status and readiness of K&A, the analysis of quantitative data obtained via questionnaires regarding five key elements (i.e. using the internet regularly in business, having a business website, qualified it staff, a current e-commerce model and the use of technology in the procurement process) is shown in Table 6.6 below.

Factors	Average	Rank	Consistency ratio (CR)
Using internet regularly in business	7.41%	5	6.04%
Business has a website	21.53%	2	
Qualified IT Staff	10.97%	4	
Current e-commerce model	16.64%	3	
Use of technology in procurement process	43.44%	1	

**Table 6.6: Current Status and Readiness of K&A for E-procurement Adoption**

Like Ahmed Bamarouf (Ahmed Bamarouf), K&A is proficient at the use of technology and gives it high priority, with an average percentage priority of 43.44%, using various types of software such as databases, ERP systems, accounting and others to carry out various business activities. The company has developed and maintained a website where it displays all its products and prices and can get feedback and queries from customers. As is evident from the figures in the table above, the presence and use of the website is considered very important by the respondents for the company's transition to the adoption of e-procurement in future and is therefore ranked second, with an average percentage priority of 21.53%. The company has hired well-qualified staff, most of whom are expatriates because of the lack of qualified IT staff in the market. As can be seen in the figures, hiring qualified staff is not a big problem for this company due to its sound financial position. The company has the sales and finances to pay them, unlike other SMEs who struggle to pay high wages to qualified staff. The average consistency ratio of 6.04% (0.6) confirms the consistency of responses from the study participants.

From the figures, it can be deduced that K&A, like Ahmed Bamarouf, qualifies for a basic level of e-procurement adoption because it uses EDI for data exchange and communication with various stakeholders and regularly uses the internet for procurement-related activities (Gunasekaran and Ngai, 2008; Azadegan and Teich, 2010). From Veit et al. (2009), it is

understood that SMEs that are accustomed to electronic data exchange and use of the internet in their business activities demonstrate a basic level of readiness for innovation and adoption of e-procurement. Further, the interview statements from various participants from K&A complement the importance of these factors for evaluating the current status in order to assess readiness for the future adoption of e-procurement in the company. The head of IT in KA believes that various current activities regarding the use of technology in the company show that the company can adopt e-procurement in the future:

*“People involved in ICT activities are well prepared for the adoption of e-procurement as compared to people who are not involved or are involved in limited activities. From the behavioural perspective and knowledge of e-procurement and related activities, the people of our SMEs are prepared to accept e-procurement if the organisation decides to adopt it.”*

The head of IT believes that:

*“EDI is an initial stage in e-procurement and indicates that organisations are a long way away from adopting web based e-procurement.”*

He further stated that:

*“EDI is an initial stage in modern e-procurement adoption.”*

This can be further confirmed by the interview statement from the head of procurement who has stated that: *“We have some qualified skilled IT professional and basic IT infrastructure within our organisation that with some more training will be able to fulfil the e-procurement responsibilities.”*

This shows that the company qualifies for the required basic level of readiness for the adoption of e-procurement.

### 6.1.2.1.2 Perceived Benefits

In relation to perceived benefits of e-procurement in K&A, the analysis of quantitative data obtained via questionnaires regarding fourteen elements (i.e. better utilization of staff, efficiencies increment, helps to improve SCM, improves existing markets, improved relationships with supplier, improved customer service levels, increased customer satisfaction, increased market share, reduction in inventory levels, reduction in non-contractual buying, reduction in operational tasks, reduction in processing time, reduction in transactional cost and support for environmental issues) are shown in Table 6.7 below. The table has been submitted as a part of Author's publication in "The GAI International Academic Conference Proceedings Istanbul, Turkey", under the Title "Evaluation and Investigation into the Potential Benefits of e-Procurement Adoption in Saudi Arabian SMEs" in 2015).

Factors	Average	Rank	Consistency ratio (CR)
Better utilization of staff	5.50%	9	7.84%
Efficiencies increment	3.38%	12	
Helps to improve SCM	11.99%	3	
Improved existing markets	6.72%	7	
Improved relationships with supplier	9.66%	4	
Improved customer service levels	8.03%	5	
Increased customer satisfaction	5.81%	8	
Increased market share	4.25%	10	
Reduction in inventory levels	7.45%	6	
Reduction in non-contractual buying	3.68%	11	
Reduction in operational tasks	3.31%	13	
Reduction in processing time	12.03%	2	
Reduction in transactional cost	16.25%	1	
Support environmental issues	1.94%	14	

**Table 6.7: Perceived Benefits from E-procurement Adoption in K&A**

As can be seen in the table, the ability of e-procurement to reduce transactional cost has been ranked highest, with a priority average ratio of 16.25%, which confirms the awareness and knowledge of company staff regarding the benefits of e-procurement to save money in transactions because orders can be placed and tracked and multiple staff in the company and on the supplier side will be aware of the order status and can thus ensure that they are processed quickly and efficiently and reach the target customer on time. Support for environmental issues, while ranked the lowest, shows that the company cares about the

environment and is aware of its corporate social responsibility. Reduction in processing time as a result of e-procurement adoption is given the second rank, with an average priority of 12.03%. The average priority and ranking of other factors are shown in Table 6.7.

Thus it can be deduced that there is good awareness about the benefits of e-procurement in K&A, and the results are comparable with Gunasekaran and Ngai(2009) findings, with some benefits being realised to a greater extent than the others. From Eei(2012) and Gunasekaran and Ngai(2009), one can easily conclude that although the SME is yet to adopt e-procurement, it has realised the benefits, which is a very positive sign for its future adoption of e-procurement.

Interview statements from the participants complement the figures on perceived benefits of e-procurement adoption. For example, the head of procurement mentioned in his response that:

*“E-procurement is a valuable tool and can greatly decrease clerical work, thereby reducing the overheads for writing, updating and maintaining papers.”*

The head of IT explained the relationship between staff utilisation and e-procurement in the following words:

*“I think there is a positive relationship between staff utilisation and e-procurement because information is passed on quickly and can be viewed by multiple people at the same time. It is machine independent, so a user can access it from any terminal with his/her user name and password, or it can even be accessed from a Smartphone if the application is compatible: thus they can look at updates in lunch time or breaks.”*

Most of the respondents believed that there is a positive relationship between an organisation’s adoption of e-procurement and a wider supplier base and ultimately a wider customer pool too. They mentioned numerous benefits that the SMEs can achieve from their exposure to a wider supplier base. The head of procurement explained the relationship between e-procurement and wider supplier base and their relationship with organisations’ success and productivity in the following words:

*“Wider supplier base helps in reducing suppliers’ monopoly – they will have more competition and SMEs will be offered the lowest possible bid, and thereby the SME can make a bigger margin of profit as compared to other SMEs who have access to fewer suppliers and will thus be more productive.”*

He also explained the benefits of e-procurement as follows:

*“E-procurement allows businesses to check their products and service orders and their status 24/7 and eradicate any delays in communication that otherwise happen in traditional procurement and thus increase business transaction speeds, which ultimately leads to better customer service.”*

The information from the e-procurement system can be easily downloaded and printed in the form of reports to be presented whenever needed, with clear and up-to-date information on them. The head of the marketing department expressed the benefits of this in the following words:

*“E-procurement keeps all departments updated about the arrival of new products so that they can meet their deadline well within time e.g. all marketing and advertisement need to be completed so when a new product arrives the customer are informed of it and can start ordering it straightaway and SMEs will not have to keep it in stock for a longer period of time.”*

The head of procurement department in KA further added that

*“Increase transparency is a great benefit of e-procurement because the selection of a supplier and a specific product must be justified, otherwise one will be held accountable and thus corrupt practices are reduced or eradicated completely.”*

He also said that e-procurement is positively related to transparency and accountability as he uttered the following:

*“Once e-procurement is adopted, things won’t take place under the carpet: an individual can’t fix things because more people from the firm and different*

*supplying firms will have an oversight on all the activities. Therefore people will be made accountable if concerns were raised by any participating party.”*

The head of procurement stated that

*“E-procurement adoption will allow firm to generate trends from previous purchasing records to choose the best supplier and the best product for the business based on customer review, feedback and sale statistics.”*

The head of KA also expressed similar views, stating that an organisation’s ability to quickly adjust to new working requirements and foster and accept changes in working culture will gain more from e-procurement adoption. He expressed his views as follows:

*“An organisation having flexible and innovative culture and with the ability to cope with higher risk is expected to gain more from e-procurement adoption.”*

This shows that there is excellent awareness and realisation about the perceived benefits of e-procurement adoption in this SME.



### 6.1.2.1.3 Perceived Barriers

The analysis of quantitative data obtained from selected Saudi Arabian SMEs shows that the barriers can be broadly divided into two categories i.e. those that are beyond the control of SMEs and those that are in the control of SMEs. The responses shows that the elements in the former category poses stronger hurdles to e-procurement adoption, while the later are of less importance and can be mitigated. The detail is shown in table 6.8

Factors	Average	Rank	Consistency ratio (CR)
Lack of knowledge and skills	9.57%	5	8.47%
Lack of appropriate infrastructure	14.52%	2	
Top management attitude	3.55%	12	
Lack of trust	8.12%	6	
Lack of financial resources	4.12%	11	
Lack of interest or support from Government	15.47%	1	
Fear of change to a new system	4.61%	10	
Immaturity of technology	10.26%	4	
Incompatibility with ERP Systems	6.47%	8	
Insufficient financial support	6.98%	7	
Security concerns	11.03%	3	
Cost of Implementation	5.32%	9	

Table 6.8: Perceived Barriers to E-procurement Adoption in K&A

The analysis clearly shows that internal barrier such as top management support and attitude, cost of implementation etc are of lower importance which otherwise means that once the external barriers are overcome, e-procurement adoption will be easy to adopt. The consistency ration of 7.8% shows that participants were consistent in their responses.

Referring to lack of support from the Government and its importance for SMEs adoption of innovation is stated by the head of KA in his interview response as follows

*“Saudi Arabia, financiers and commerce banks avoid lending to SMEs, which is evident from the fact that the debt capital for SMEs is less than 2% of the country.”*

Further it was also mentioned that the government has failed to set up training institutes and places for people to give them awareness about the use and benefits of innovation adoption and how to effectively use those e.g. the head of KA stated as follows

*“The training institutes are very expensive in the country and charge up to \$3000 for a short course in accounting or IT.”*

He further understands that

*“There is a lot of talk about the importance of IT in SMEs from the IT and commerce ministry in Saudi Arabia but fewer practical steps have been taken, especially investing in training and development of SME owners, whose role in accepting and implementing innovation is the most important.”*

Referring to the internal barriers such as the lack of skilled knowledgeable employees in Saudi SMEs and lack of awareness in SME owners and management regarding innovative technology the head of KA stated that

*“Most of the SMEs’ owners have no or very basic knowledge of ICT who takes key decision such as e-procurement adoption, we can only propose things to them but the final decision lie with them.”*

The deputy head of KA mentioned that the government has yet to adopt a legislative framework to be used in case of conflicts in e-commerce and e-procurement as it takes the business beyond geographical boundaries. He thus stated that

*“In the absence of a clear legislative framework, SMEs cannot even think about the adoption of e-procurement because they won’t be able to resolve their issues and will further deepen the trust deficit which already exists in people’s minds regarding online business.”*

The head of procurement department in the company also stressed on the importance of a unified legislative framework that is consistent with the rest of the world. He therefore stated that

*“Lack of clear e-trading laws is a great issue and a big barrier to the adoption of e-procurement in the kingdom. In the absence of such laws, conflict will arise that can’t be resolved.”*

The head of IT in KA stated that

*“The ministry of commerce and IT has recently taken some encouraging steps, which I think will facilitate some good developments in this regard and will promote e-commerce in the country in the next couple of years.”*

The head of the procurement department in KA stated that:

*“In addition to improvement in infrastructure, online payment and regulatory framework, another important element of e-procurement adoption is to have postal addresses that can cover all homes, shops, companies and streets in the country, and this is where the government’s role is very important. SMEs and other organisations rely on unique traceable addresses and without them e-procurement adoption is difficult.*

#### 6.1.2.1.4 Critical Success Factors

In terms of critical success factors for the adoption of e-procurement in KA, the analysis of quantitative data obtained via questionnaire regarding fourteen elements (i.e. a comprehensive strategy, technology standards, organisations process re-engineering, user interface, authentication and integration of the new e-procurement, education and training, consent of stakeholders and perform stakeholders, firm's size , centralized control and management, communication between participants, clear and achievable implementation, clear accountability for buying, close collaboration with suppliers, top management involvement and support and use of prototypes) are shown in Table 6.9, below.

Factors	Average	Rank	Consistency ratio (CR)
A comprehensive strategy	5.92%	9	7.15%
Technology standards	7.59%	6	
Organisation's process re-engineering	3.89%	13	
User interface	5.93%	8	
Authentication and integration of the new e-procurement	3.60%	14	
Education and training	9.83%	4	
Consent of stakeholders and perform stakeholders	3.98%	11	
Firm's size	8.24%	5	
Centralized control and management	11.39%	2	
Communication between participants	6.65%	7	
Clear and achievable implementation	4.09%	10	
Clear accountability for buying	3.97%	12	
Close collaboration with suppliers	10.44%	3	
Top management involvement and support	12.61%	1	
Use of prototype	1.87%	15	

Table 6.9: Critical Success Factors for E-procurement Adoption in K&A

From this table, it can be seen that top management involvement and support is the most critical factor, with a priority ratio of 12.61%, and is ranked first within the company. This is not unexpected, because as in the majority of Saudi Arabian SMEs, the top management is mostly the owners, who make all the decisions, and the only people whose support will matter are the suppliers because without their collaboration, e-procurement cannot be implemented. Factors such as integration with the current system, system re-engineering and use of prototypes, with an average priority ratio of 3.60%, 3.89% and 1.87% respectively, are ranked lower because the company has sufficient finances and the system

can be implemented as soon as the management is willing. A consistency ratio of 7.9% confirms the consistency of the empirical results of the study.

The figures are complemented by the interview statements of the participants, which show that they have great awareness about the critical factors for the successful adoption of e-procurement. They mentioned quite a few CSFs, of which some were more important than others.

The head of IT in KA also expressed similar views on the integration and compatibility of any chosen e-procurement solution:

*"I think for any e-procurement software solution to be accepted and being effective in the organisation, it is extremely vital that it is compatible with existing system especially with the finance system of the SME."*

The head of KA also responded in a similar fashion and stressed that prototype version is very important:

*"I think any software solution's importance can be seen after using it in practice. What people say in theory, in adverts and in marketing is sometime half the truth and in reality the system doesn't offer many functionalities. The compatibility issues can only be unveiled once the system is installed. Sometime the system is compatible but is very slow and faulty, so until it is not fully evaluated and practically tested by the actual worker it, the full version shouldn't be installed."*

The deputy head of KA thus called for gradual implementation and stressed that full implementation in one go can be very risky for the organisation. He described his thoughts as follows:

*"I think one should adopt a gradual approach in the adoption of e-procurement. E-procurement is a very complex process and it is vital that first system is gradually upgraded, people are trained or more qualified people hired and then have a slow and gradual transition so that working is not affected. Gradual implementation will allow the SME to handle and control activities and learn*

*things quickly. Initially a limited number of known suppliers should be included and gradually it should be extended to more suppliers.”*

The head of procurement explained the top management factor as follows:

*“To be honest, the success of any project depends on the top management. If top management has the will and vision to initiate a process or project, the process becomes very easy; otherwise it is very difficult.”*

Interview statements from most of the other participants showed that top management support is a key factor in the adoption of e-procurement in Saudi Arabian SMEs.

The Deputy Head of KA explained the critical nature of top management support in e-procurement adoption as follows:

*“In Saudi Arabia, top management sets up the milestones, commits and provides the necessary resources and has the mandate to procure necessary equipment and other things for the organisation. If top management doesn’t have the push or zeal for the adoption of e-procurement, shaking the bureaucratic slumber in the organisation and ensuring necessary coordination between departments, that will make it hard to adopt it.”*

The head of KA also showed awareness that the role of top management is critical:

*“Ultimately, we the top management will decide the adoption of e-procurement but we must get the consent and opinion of stakeholders within and outside the organisation before making a decision, but yes, the ultimate decision rests with the top management.”*

The head of the IT team at KA expressed his views as follows:

*“We recommend things to the top management and explain the benefits of those innovations to them but the final decision rests with them. Further, even after e-procurement is adopted, their consent for licensing, upgrading of the software and infrastructure will be needed to get full benefits out of the solution. If there*

*is no support from top management or leadership, the subordinates will get discouraged and won't show the required efficiency."*

The head of KA stated that it is a mutual decision that cannot be taken by an organisation or a CEO on its own:

*"E-procurement adoption needs to be mutually decided by all stakeholders: the organisation, its employers, the suppliers and partners."*

The head of procurement in KA believed that e-procurement can only be adopted if all the stakeholders are willing to adopt it – otherwise it will not yield benefits:

*"The role of stakeholders, especially suppliers, is very critical for the adoption of e-procurement. An SME would like to stay with its long-term trusted suppliers in addition to adding more potential suppliers, and if they are not willing to adopt e-procurement for any reason, the SME won't be able to make the decision on its own."*

The head of KA also stated that:

*"Technology changes the way people work, so in a way it alters their personal and social interaction and therefore an analysis of people's planned behaviour is very critical for the adoption of e-procurement."*

The head of the IT department in KA stated that:

*"The value-attitude-behaviour model reveals that people's planned behaviour and working culture is greatly impacted by technological adoption and therefore a detailed analysis of such alteration must be taken into consideration before the adoption of e-procurement."*

### 6.1.2.1.5 Future Organisational Performance

With regard to the impact of e-procurement adoption on perceived future organisational performance of KA, the analysis of quantitative data obtained via questionnaire regarding fourteen elements (i.e. improved performance in terms of streamlining performance and reducing cost, e-procurement leads to sharing of information, short-term organizational performance, long-term organizational performance, improved cost of performance in organization, organizational competitiveness and organization's revenue increment) is shown in Table 7.10 below.

Factors	Average	Rank	Consistency ratio (CR)
Improved performance in terms streamlining performance and reducing cost	9.55%	5	3.81%
E-procurement leads to sharing of information	9.02%	7	
Short-term organizational performance	9.68%	4	
Long-term organizational performance	23.80%	1	
Improved cost performance in organization	19.60%	2	
Organizational competitiveness	19.03%	3	
Organization's revenue increment	9.31%	6	

Table 2.10: Impact of E-procurement Adoption on Perceived Future Organisational Performance in K&A

These figures show that the company, its management and staff are well aware of the fact that e-procurement adoption will be beneficial for the company in the long term and has the ability to reduce cost and improve organisational competitiveness. The company expects that performance will be improved in the long term and this factor is thus given the highest priority, with a score of 23.08%. Similarly, reduction in cost for performance and organisational competitiveness are ranked second and third, with average percentage priority of 19.60% and 19.03% respectively. Due to the initial cost of installation and staff training, the benefits might not be realised in the short term, which is why short-term performance is ranked lower, with an average priority of 9.68%. The results here are highly consistent, with a CR of 0.3.

Interview statements of participants from the SME reveal that e-procurement will have a positive impact on its future performance. For example, the head of KA also believed that improved communication with suppliers and customers is very important and contributes positively to the performance of the organisation. He described his opinion as follows:



*"I think e-procurement has a great potential to improve our organisational performance because it can reduce purchase cost and transaction cost, and can also increase the speed of communication and purchasing activities."*

The head of the procurement department believes that all business departments depend on the procurement department and if there is any deficiency or delay in procuring goods and services, other departments are affected:

*"E-procurement will automate the procurement process and will improve communication and cooperation between departments. Thus other departments will not have to wait for longer and can do their activities efficiently: as a result, overall business efficiency will increase."*

The head of KA's IT department agreed:

*"E-procurement results in efficient communication, which results in avoiding unnecessary costs for the organisation."*

The head of KA stated that timely delivery of products and services is also related to the timely communication of information. He expressed his views as follows:

*"E-procurement facilitates quick and timely information sharing with suppliers, resulting in timely delivery of material required for various projects in different parts of Saudi Arabia and elsewhere where the company carries out its projects."*

The head of the procurement department in KA stated that:

*"E-procurement can be a source of competitive advantage for the firm in the current fast-paced global business scenario."*

#### 6.1.2.1.6 Culture Factors

On the other hand, the head of KA stated that the decision about e-procurement adoption can be greatly impacted by prevailing norms and work patterns of the organisation and thus cultural analysis is very important:

*“Social factors, cultural norms and behavioural characteristics of people in the organisation either facilitates or impede the adoption of e-procurement and other innovative technology and thus act as deciding factors in the diffusion of new technology.”*

The head of the procurement department in KA specifically mentioned important cultural traits that determine the current readiness of a firm for the adoption of e-procurement and other innovative ICT applications:

*“People’s views and perceptions about new technology, prevailing language of communication, individual and business beliefs and norms impact the adoption of e-procurement in Saudi Arabian SMEs.”*

Based on cultural aspects the head of KA also understands that the prevailing behavioural and working patterns of all stockholders pose a bigger cultural inertia for the adoption of e-procurement:

*“Unless there is greater awareness, training and education for technology management, employees’ and suppliers’ behaviour will be a bigger cultural challenge for the adoption of e-procurement.”*

Also, the head of KA stated that:

*“Business culture of a country, which includes consumer preferences, business culture, industry structure and other demographic elements, constitutes a very important that will affect the adoption of e-procurement Saudi Arabian SMEs.”*

The Deputy Head of KA mentioned a very important point about the business environment:

*“Saudi Arabian SMEs have a desire to extend themselves not only to various parts within the country but also to other Middle East countries and I feel that this desire can thus be termed as an important enabler of e-procurement adoption.”*

#### **6.1.2.1.7 External Factors**

As in Ahmed Bemarouf, most of the external factors mentioned by the interview participants were related to Government, infrastructure, perception of the use of technology etc. These are evident from the interview statements of the participants: for example, the head of KA also termed government support a vital external factor for the adoption of e-procurement. He expressed his views as follows:

*“One of the most important external factors that can influence SMEs’ adoption of e-procurement is the Government. In a country like Saudi Arabia, where the culture is very passive in terms of online payments and transactions, the government’s role is vital to encourage SMEs and provide them with all necessary financial, regulatory and infrastructural support for the adoption of e-procurement.”*

The head of the IT department in KA said:

*“Government support is one of the most important external factors for the adoption of e-procurement in the kingdom of Saudi Arabia. Government should support and encourage the SMEs to adopt e-procurement and its applications. It must educate SMEs and individuals of the importance of e-procurement and provide them with the necessary assistance.”*

In contrast, the head of IT in KA said:

*“The 15% of the population that live in rural areas are scattered and therefore providing them with all the infrastructural facilities needed is not easy for the government.”*

However, majority of the population are living in cities where they enjoy most of the facilities needed for e-business activities, so the country can proceed to the adoption of e-procurement in its SMEs, which are obviously situated in cities.

#### **6.1.2.2 Summary**

From this case study, it is evident that the SME qualifies for the basic level of readiness needed for e-procurement adoption. Further, the management and staff are aware of the benefits of e-procurement adoption for the SME. Also, there is good awareness regarding barriers, critical success factors and the future impact of the adoption of e-procurement on SMEs' performance. Respondents also revealed key external factors that can affect the adoption of their SME in the Saudi Arabian context.

### **6.1.3 Case: 3: Al-Maram**

#### **6.1.3.1 Introduction (Context of TheCase Study)**

Durrat Al-Maram was established in 1995 by Mr Soliman Al-Hamad for the purpose of importing perfumes and cosmetics from different Europe and American brands and distributing the packages around the middle region of Saudi Arabia. The office is based in Riyadh and there are twelve people working in this company.

The company mainly sell perfumes and cosmetics products to its clients based in the middle region of Riyadh Saudi Arabia procure its products from its suppliers based Europe and America. It sells the products traditionally from its shops base in Riyadh. The company is smaller and have very limited financial resources. Due to less financial resources the company doesn't have the services of skilled and qualified staff. The owner of the company is not well qualified and also do not have good awareness of the benefits of technology in business.

The company procure its products using traditional via phone and FAX. The company do sometime order products oline by visiting their supplier's website that arebased in other countries.

### 6.1.3.1.1 Current Status and Readiness

With regard to the current status and readiness of AL-Maram, the analysis of Quantitative data obtained via questionnaire regarding five key elements (i.e. using the internet regularly in business, the business having a website, qualified IT staff, the current e-commerce model and the use of technology in the procurement process) is shown in Table 6.11 below.

Factors	Average	Rank	Consistency ratio (CR)
Using the internet regularly in business	40.08%	1	3.47%
Business has a website	10.17%	4	
Qualified IT staff	26.68%	2	
Current e-commerce model	8.30%	5	
Use of technology in the procurement process	14.77%	3	

**Table 6.11: Current Status and Readiness of Al-Maram for E-procurement Adoption**

As can be seen from the table, the company does use the internet in its premises and has some qualified staff, but because it is very small, with a total of twelve employees, there is only one qualified member of IT personnel. The use of the internet and having one qualified staff member lead to the respondents rating these two factors as highly important for their adoption of e-procurement, with consistency ratios of 40.08% and 26.68% respectively. The company does not have a website and the use of technology is very low, and also there is no e-commerce model: this means that according to Gunasekaran and Ngai (2008) and Azadegan and Teich, (2010), it is not yet qualified for a basic level of e-procurement readiness. However, as argued by Veit et al. (2009), the use of the internet in the company for e-mail and other communication purposes is an encouraging sign and shows that the company and its staff are aware of the effectiveness of the internet and thus qualify for a minimal basic level of qualification. The results are consistent, with an average percentage priority of 3.47%.

Thus it can be deduced that Al-Maram is lagging behind Ahmed Bamaroof and KA due to its smaller business scope and fewer financial resources. However, the interview statements from the company show that the management and staff are quite willing to adopt innovation to increase its business scope: for example, the head of the company, who is also the owner, stated that:

*“Innovative ICT equipment is good but we do not have enough funding to invest in qualified IT staff and also to buy innovative ICT equipment. Skilled ICT staff are rare in the country and those available have high salary demands.”*

He further emphasised that the role of government is critical in the company’s readiness for e-procurement adoption:

*“The government and other financial institutes’ support is very low for SMEs like ours because they prefer to support more stable and bigger organisations: therefore we cannot afford to invest in innovative technology and skilled staff. In order to upgrade our infrastructure and adopt technology, we need more support.”*

On the availability of qualified IT staff, he said:

*“It is difficult to hire professional IT staff because they are rare and demand a high salary.”*

Thus, one would deduce that the company is a way off from the adoption of e-procurement and is currently not ready for such adoption, with minimal use of technology and a lack of staff and the financial resources needed.

### 6.1.3.1.2 Perceived Benefits

With regard to the perceived benefits of e-procurement adoption in Al-Maram, the quantitative data obtained via questionnaires regarding the fourteen key factors, such as better utilization of staff, efficiencies increment, help to improve SCM, improve existing markets, improve relationships with supplier, improve customer service levels, Increase customer satisfaction, increase market share, reduction in inventory levels, reduction in non-contractual buying, reduction in operational tasks, reduction in processing time, reduction in transactional cost and support environmental issues, were ranked on the basis of their importance, as shown in Table 6.12 below. The table has been submitted as a part of Author's publication in "The GAI International Academic Conference Proceedings Istanbul, Turkey", under the Title "Evaluation and Investigation into the Potential Benefits of e-Procurement Adoption in Saudi Arabian SMEs" in 2015).

Factors	Average	Rank	Consistency ratio (CR)
Better utilization of staff	5.37%	9	7.65%
Efficiencies increment	3.12%	13	
Help to improve SCM	10.07%	3	
Improved existing markets	8.12%	5	
Improved relationships with suppliers	7.10%	8	
Improved customer service levels	7.35%	7	
Increased customer satisfaction	7.57%	6	
Increased market share	9.55%	4	
Reduction in inventory levels	4.50%	10	
Reduction in non-contractual buying	3.55%	11	
Reduction in operational tasks	3.30%	12	
Reduction in processing time	12.95%	2	
Reduction in transactional cost	15.75%	1	
Support environmental issues	1.77%	14	

Table 3.12: Perceived Benefits of E-procurement Adoption in Al-Maram

From the analysis, it is evident that there is general awareness about the benefits of e-procurement in the company in terms of increasing business efficiency via reduction in cost and improvement in processing time, and also its ability to improve supply chain management. These aforementioned factors are therefore ranked first, second and third, with an average percentage priority of 15.75%, 12.95% and 10.07% respectively. The results are thus comparable with the findings from Gunasekaran and Ngai(2009) to an extent, and are encouraging regarding the realisation of the benefits of e-procurement, although the firm is quite far from the adoption of e-procurement due to technical and



financial deficiencies. According to Eei(2012), the realisation of benefits is an encouraging sign for the SME's future adoption of e-procurement.

The realisation of e-procurement benefits can be further confirmed from the interview statements of the participants from the SME. For example, the head of the company raised a very interesting point in relation to the cost-effectiveness of e-procurement:

*“Historically, e-procurement is a very cost-effective tool that reduces communication cost, transactional cost and other overhead costs such as clerical work and the use of paper, or using other expensive communication methods, but for an organisation like ours where the sales are relatively small, the initial cost can be quite high and sometime not affordable, but in the long term it will allow us to increase our market and business.”*

He further stated that there is a positive relationship between staff utilisation and efficiency and e-procurement adoption:

*“The adoption of e-procurement not only allows businesses to reduce the staff in their procurement departments but also make those staff work with double or triple the efficiency they would otherwise.”*

The head of Al-Maram also mentioned another interesting factor:

*“Most of this innovative technology such as e-procurement is tailored for western SMEs and thus its adoption will bring some of those characteristics to Saudi Arabian SMEs, which will be beneficial for our future business expansion.”*

### 6.1.3.1.3 Perceived Barriers

The quantitative data obtained from respondents in AL-Maram prioritised the factors mentioned in NG (2009) model and broader e-procurement literature as follows

Factors	Average	Rank	Consistency ratio (CR)
Lack of knowledge and skills	12.09%	3	8.88%
Lack of appropriate infrastructure	7.81%	6	
Top management attitude	3.36%	12	
Lack of trust	7.21%	7	
Lack of financial resources	15.53%	1	
Lack of interest or support from Government	13.57%	2	
Fear of change into a new system	3.81%	11	
Immaturity of technology	6.19%	9	
Incompatibility with ERP Systems	4.31%	10	
Insufficient financial support	6.94%	8	
Security concerns	9.40%	5	
Cost of Implementation	9.77%	4	

Table 6.13: Perceived Barriers to the Adoption of E-procurement in Al-Maram

From the data it is evident that Al-Maram being the smaller company is worried about the cost of implementation and has thus associated highest priority with the financial factors with a percentage priority of 15.53%. This is on contrary to KA and Ahmed Bemarouf where external factors such as Government support, lack of infrastructure and security were the top barriers, however it is obvious because these companies are financially very sound as compare to Al-Maram. However it can still be associated with lack of support from the government because in developed world SMEs are provided financial help by the government. A consistency ration of 9.0% shows that the respondents were consistent but not as consistent as were the other bigger companies which is an indication of less awareness of the innovative technology in the company as compare to others. The head of the company interview statement reveals that the company Lack financial resources needed for the adoption of innovative IT tools

*“Innovative ICT equipment is good but we do not have enough funding to invest in qualified IT staff and also to buy innovative ICT equipment. Skilled ICT staff are rare in the country and those available have high salary demands.”*

Further he emphasised that the Government should step forward and provide financial help to SMEs for their adoption of e-procurement and other innovative technologies

*“The government and other financial institutes’ support is very low for SMEs like ours because they prefer to support more stable and bigger organisations, therefore we cannot afford to invest in innovative technology and skilled staff.”*

He also emphasised on the importance and lack of skilled people in the country

*“It is good to use innovative technology such as e-procurement in the firm but our staffs lack the knowledge and skills to run such a system.”*

Further he stated that

*“If the government is really interested in the development of e-trading, they must establish a legislative framework because it will not only protect the buyer and seller but will also help in promoting e-trading Activities in the country, which will have a positive impact on its economy.”*

As in other companies, the barriers mentioned were related to issues such as infrastructure, legislation, lack of payment options and trust in them and lack of own postal addresses. Some of these factors are mentioned in the participants’ interview statements: for example, referring to the company’s financial weaknesses and government and other institute lack of interest, the head of the company said:

*“The business environment of Saudi Arabia is not very encouraging for SMEs. It is very hard to get financial support from government and other financial institutions and bankruptcy is not financially survivable as in other countries. Entrepreneurs are thus stigmatised by failures.”*

#### 6.1.3.1.4 Critical Success Factors

In relation to critical success factor for the adoption of e-procurement in Al-Maram , the analysis of quantitative data on fifteen selected factors (i.e. a comprehensive strategy, technology standards, organisations process re-engineering, user interface, authentication and integration of the new e-procurement, education and training, consent of stakeholders and perform stakeholders, firm’s size, centralized control and management, communication between participants, clear and achievable implementation, clear accountability for buying, close collaboration with suppliers, top management involvement and support and use of prototype) obtained via questionnaire is show below

Factors	Average	Rank	Consistency ratio (CR)
A comprehensive strategy	5.48%	9	7.60%
Technology standards	7.90%	5	
Organisations process re-engineering	3.38%	13	
User interface	5.47%	10	
Authentication and integration of the new e-procurement	5.93%	8	
Education and training	10.12%	4	
Consent of stakeholders and perform stakeholders	3.55%	12	
Firm’s size	6.72%	6	
Centralized control and management	6.53%	7	
Communication between participants	11.25%	3	
Clear and achievable implementation	3.80%	11	
Clear accountability for buying	3.35%	14	
Close collaboration with suppliers	11.40%	2	
Top management involvement and support	13.62%	1	
Use of prototype	1.62%	15	

Table 6.14: Critical Success Factors for the Adoption of E-procurement in Al-Maram

The analysis of data in Table 6.14 shows that top management help and involvement is key to the firm’s future adoption of e-procurement, with an average percentage priority of 13.62%. This is understandable because top management are the owners of the company, who make all the key decisions and provide the financial resources required for the adoption of innovative technology, so unless they are not willing and convinced, technological innovation will not take place. Similarly, the willingness of suppliers is also critical, with a priority ratio of 11.40%, because if they are not ready or have not already adopted e-procurement, the firm cannot adopt it. Use of prototype was ranked the lowest, which is somewhat surprising, but it might be due to the company’s lack of experience with

technology, meaning that it does not yet understand the importance of prototypes. A CR of 0.7 indicates that the responses are consistent.

These findings can be further confirmed by the interview statements of the participants from the SME. For example, the head of Al-Maram was much in favour of the use of prototypes. He explained his reasons for the prototype solution as follows:

*“Being a very small organisation, we have limited human and monetary resources and have limited knowledge of e-procurement. An evolutionary or prototype e-procurement solution will allow us to see how the software works, what added advantages it will provide to the organisation, its compatibility with existing infrastructure and whether people will be able to use it or not. I would therefore prefer to try a prototype before investing in an actual solution.”*

He also said:

*“To be honest, people with adequate IT skills and competencies are extremely vital for the organisation’s adoption of e-procurement. We at the moment lack such people due to limited resources and that is the reason why I feel we are not ready for the adoption of e-procurement.”*

He described user-friendliness as very important, particularly for his organisation, which has limited skilled resources.

*“I think user friendliness of the software and availability of a help facility is very important for successful adoption of e-procurement.”*

From the above, it is evident that top management support, supplier willingness and cooperation and users’ training and education are critical for the company’s future adoption of e-procurement.

### 6.1.3.1.5 Future Organisational Performance

With regard to the impact of e-procurement impact on the organisation's future performance, the analysis of quantitative data obtained via questionnaires from Al-Maram regarding seven elements (i.e. Improve performance in terms of streamlining performance and reducing cost, e-procurement leads to sharing of information, short-term organizational performance, long-term organizational performance, improve cost performance in organization, organizational competitiveness and organization's revenue increment), is shown in Table 6.15, below.

Factors	Average	Rank	Consistency ratio (CR)
Improved performance in terms of streamlining performance and reducing cost	7.49%	7	6.74%
E-procurement leads to sharing of information	7.56%	6	
Short-term organizational performance	13.83%	4	
Long-term organizational performance	19.13%	2	
Improve cost performance in organization	22.04%	1	
Organizational competitiveness	18.10%	3	
Organization's revenue increment	11.83%	5	

Table 6.15: The Impact of E-procurement on future performance in Al-Maram

From these figures, it is evident that reduction in the cost of organisational performance is ranked the highest, with an average priority percentage of 22.04%, which shows that the organisation believes that e-procurement can potentially decrease its cost of performance and thus improve its efficiency. Further, it can also be noted that the benefits of e-procurement adoption will not surface immediately, due to its initial implementation and running cost; however, it will benefit the organisation in the longer run, which is why long-term performance improvement is ranked second, with a priority percentage of 19.13%. Sharing of information and streamlining performance were ranked lower, with percentages of 7.56% and 7.49% respectively, which is due to the company's smaller scope and the much smaller number of stockholders with which to share information.

This can be further confirmed by the interview statements of the participants: for example, the company head stated that:

*"I do not see any short-term performance improvement for my firm from e-procurement adoption because the initial cost will be high."*

Meanwhile, the procurement manager said:

*"E-procurement results in efficient communication, which results in avoiding unnecessary costs for the organisation."*

Further, the head of Al-Maram stated that:

*"E-procurement will integrate the company's processing: i.e. processes such as transportation, sales and procurement are co-ordinated in such a way that customer satisfaction and value is achieved, resulting in overall efficiency of the organisation."*

It is evident that the company is aware of the impact of e-procurement on its future performance and believes that such performance cannot be achieved in the shorter run due to higher initial cost, but will be beneficial in the longer run.

The head of Al-Maram stated that:

*"An organisation with greater employee empowerment, knowledge management techniques and open to taking risks and challenges is expected to gain more and perform better in the wake of e-procurement adoption."*

#### **6.1.3.1.6 Culture Factors**

In related to culture aspects, the head of Al-Maram added:

*"To be honest, e-procurement allows you to communicate to people across different countries and the language of communication is mostly English, along with some key business vocabulary. Therefore, an organisation needs to have individuals who understand the language and also are open-minded about changes in work patterns. Language has been a barrier in the past but the situation is changing, with more school colleges and universities adopting English*

*as a medium of education and a greater number of students graduating from abroad.”*

Also he stated that:

*“The behavioural characteristics and perception of management, employees and supplier is a greater cultural challenge for the adoption of e-procurement. Language of communication (English) and less technical skills further worsens the cultural inertia.”*

The procurement manager of Al-Maram understands that organisation culture is critical for the adoption of e-procurement:

*“Organisations with innovative culture, having already adopted some innovations and having skilled people, find e-procurement adoption easy, while those with less experience and using traditional ways of business find it difficult.”*

#### **6.1.3.1.7 External Factors**

Al-Maram is a relatively smaller company and is not financially very sound. It has only one qualified IT person and the rest of the staff are not IT skilled and trained, which means that it has internal weaknesses; however, like the other SMEs, it is affected by the external factors to a greater extent. Even the financial weaknesses can be related to government and other financial institutions' lack of interest in providing loans to these SMEs to extend and grow their business. Referring to the external factors, the interview participants mentioned quite a few factors which affect their progress in adopting innovative technologies such as e-procurement.

Similarly, referring to the lack of IT-skilled people, the head of the company stated that there is a general scarcity of such personnel in the country and that those with skills demand higher salaries, which small businesses cannot afford. He further stated that:

*“In order for us to adopt e-procurement, we need IT skilled people, who are generally very scarce in the country. You can't rely on expatriates because firstly it is very costly. The local human workforce must develop in order to make e-*



*procurement adoption easy. At the moment, the skilled IT workforce is too small to take up the positions.”*

### **6.1.3.2 Summary**

From the case study, it is evident that this SME lacks technical and financial skills; however, the awareness and enthusiasm to adopt technology exists. Management are aware of the benefits that the technology can instil in their business and that it can help them to grow their business further. Similarly, they are aware of most of the barriers in the country that prohibit small SMEs to adopt e-procurement and other innovations. There is a positive attitude and perception regarding the impact of e-procurement on the company's future performance in the longer run. Similarly, the participants mentioned that although they have internal weaknesses such as lack of financial resources and IT skilled staff, these issues can be related to external factors such as the lack of government help and support and general scarcity of IT staff and lack of training facilities in the country.

## 6.1.4 Case: 4: Al-Amazon

### 6.1.4.1 Introduction (Context of TheCase Study)

Raw Al-Amazon was established in 2000 by Mr Saleh bin Gishian for the purpose of importing perfumes and other beauty goods from abroad. Al-Amazon has two shops based in Riyadh and employs nine people. The company mainly sells perfumes to its clients based locally and procures its products from its suppliers based locally as well as abroad. It sells the products traditionally from its shops. The company is smaller and has very limited financial resources. Due to less financial resources, the company doesn't have the services of skilled and qualified staff. The owner of the company is not qualified and also does not have good awareness of the benefits of technology in business.

The company procures its products using traditional methods by visiting the bigger suppliers in the country and sometimes places an order via phone and FAX. The company does sometimes order products online by visiting their supplier's website that are based in other countries.

#### 6.1.4.1.1 Current Status and Readiness

In relation to the current status and readiness of Al-Amazon, the analysis of quantitative data gathered via questionnaires on five elements (i.e. using the internet regularly in business, business has a website, qualified IT Staff, current e-commerce model and use of technology in procurement process) is shown in Table 6.16, below.

Factors	Average	Rank	Consistency ratio (CR)
Using internet regularly in business	41.68%	1	3.20%
Business has a website	8.44%	4	
Qualified IT Staff	28.78%	2	
Current E-commerce model	7.16%	5	
Use of technology in the procurement process	13.94%	3	

Table 6.16: Current Status and Readiness for E-procurement Adoption in Al-Amazon

From the data in Table 6.16, it is evident that the company regularly uses the internet in its premises and this factor is thus considered to be the most important for its future adoption of e-procurement and is given the highest priority, with a percentage of 41.68%. Qualified IT

staff are ranked as the second most important factor for its future adoption of e-procurement, with an average percentage priority of 28.78%, although there is only one IT technician in the company who only has basic computer knowledge and does not have any experience of innovative IT. The company does not use any innovative technology and does not have a website to display or sell its products. Nor does it use any e-commerce model, and this factor is thus given the lowest priority by the respondents, at 7.16%.

The findings can be complemented by the interview statements of study participants from the company. For example, with regard to the lack of Government interest to support smaller organisations, the head of Al-Amazon stated that:

*“Honestly speaking, government and other institutes do not provide any financial assistance to smaller firms. The financial institute’s conditions and procedures for obtaining loans are very difficult for smaller organisations to fulfil. They need to be relaxed in order for smaller firms like ours to flourish.”*

He also stated that due to limited financial resources and lack of help from government and other financial institutes, they cannot afford the higher salaries demanded by skilled people:

*“We do not have qualified and skilled IT professionals to fulfil the e-procurement responsibilities.”*

From this, it is very evident that the company lacks financial and technical skills, while government lack of interest makes it even more difficult for it to adopt innovations such as e-procurement. Thus it is not currently ready for a basic level of e-procurement adoption, although there is some interest and enthusiasm towards the adoption of technology.

#### 6.1.4.1.2 Perceived Benefits

The analysis of quantitative data obtained from AI-Amazonin relation to the perceived benefits of e-procurement adoption obtained via questionnaires on fourteen elements, such as better utilization of staff, efficiencies increment, help to improve SCM, improved existing markets, improved relationships with suppliers, improved customer service levels, increased customer satisfaction, increased market share, reduction in inventory levels, reduction in non-contractual buying, reduction in operational tasks, reduction in processing time, reduction in transactional cost and support environmental issues, are shown in Table 6.17, below. The table has been submitted as a part of Author's publication in "The GAI International Academic Conference Proceedings Istanbul, Turkey", under the Title "Evaluation and Investigation into the Potential Benefits of e-Procurement Adoption in Saudi Arabian SMEs" in 2015).

Factors	Average	Rank	Consistency ratio (CR)
Better utilization of staff	4.48%	10	7.78%
Efficiencies increment	3.96%	11	
Help to improve SCM	13.66%	2	
Improve existing markets	15.26%	1	
Improve relationships with supplier	7.92%	5	
Improve customer service levels	6.74%	7	
Increase customer satisfaction	5.84%	8	
Increase market share	7.68%	6	
Reduction in inventory levels	4.86%	9	
Reduction in non-contractual buying	3.28%	12	
Reduction in operational tasks	3.00%	13	
Reduction in processing time	9.96%	4	
Reduction in transactional cost	11.48%	3	
Support environmental issues	1.80%	14	

Table 6.17: Perceived Benefits of E-procurement Adoption in AI-Amazon

From these figures, it is evident that the role of e-procurement in improvements to the company's growth and existing market share is ranked the highest, with an average percentage priority of 15.26%, while improvement in supply chain management is ranked the second most important element, with a priority of 13.66%. This indicates that the company has a good awareness of the benefits of e-procurement adoption. Similarly, reduction in operational cost is given a lower rank, which is understandable because e-procurement helps in supply chain management but has less to do with operational tasks. There is a realisation of the impact of e-technology on the environment, although this factor

is given very low priority, perhaps due to the company's current scope of business and its use of paper-based systems. The results are consistent, with a CR of 0.78

These findings can be further complimented by the interview statements of the participants from the company. The head of AI-Amazon, while stating that his organisation would struggle to adopt e-procurement given its current financial and infrastructural resources, still maintained that it is a very good tool to increase the utilisation and efficiency of staff, as information is available at all times. He expressed his views in the following words:

*“The 24/7 availability of information on e-procurement will allow staff to see the updates from anywhere and take appropriate action. Since information on orders is always available, staff will be able to undertake maximum transactions in their allocated work period.”*

He also said that:

*“E-procurement has the ability to reduce procurement time significantly for the organisation.”*

### 6.1.4.1.3 Perceived Barriers

AHP analysis of respondents' data from AI-Amazon on perceived barriers elements is shown in table 6.18 along with their ranking and consistency ratio.

Factors	Average	Rank	Consistency ratio (CR)
Lack of Knowledge and Skills	12.25%	4	8.95%
Lack of appropriate infrastructure	8.17%	6	
Top management attitude	3.05%	12	
Lack of lack of trust	6.30%	7	
Lack of financial resources	15.58%	1	
Lack of interest or support from Government	14.17%	2	
Fear of change to a new system	3.55%	11	
Immaturity of technology	4.83%	9	
Incompatibility with ERP Systems	3.88%	10	
Insufficient financial support	5.75%	8	
Security concerns	9.80%	5	
Cost of implementation	12.70%	3	

Table 6.18: Perceived barriers to e-procurement adoption in AI-Amazon

The results were not different from other cases as lack of infrastructure and lack of government support were the high priority barriers for the adoption of e-procurement. Due to the lower size and less financial resources cost of implementation and lack of skilled and knowledgeable people were the third and fourth most important barriers for the company's adoption of e-procurement. List of remaining barriers with their average priorities is shown in table 6.18. A consistency ration of 0.9 is slightly higher but acceptable in a company where most of the respondents have limited e-procurement knowledge.

The presence and importance of these barriers can be confirmed further by the interview statements of participants e.g. the head of AI-Amazon stated that

*“To be honest our ICT infrastructure is very weak, firstly we do not have enough funding to invest in qualified IT staff and also to buy innovative ICT equipment. Skilled ICT staffs are rare in the country and those available have high salary demands.”*

Talking about the lack of skilled and knowledgeable people he stated that

*“We do not have qualified and skilled IT professionals to fulfil the e-procurement responsibilities.”*

Further highlighting, the limited financial resources of the company the head stated that

*“Honestly we do not have money to train our staff because the training institutes are very expensive and are also not up to the international standards in terms of training and education. We want government to invest more in SMEs in the form of training and development and by establishing cheaper or free training institutes, because SMEs play a key role in the economy.”*

The company head also believe that:

*“It is very hard for people to accept alterations to their work patterns and in this case there is job insecurity for those with less technical skills.*

#### 6.1.4.1.4 Critical Success Factors

The analysis of quantitative data from AI-Amazon, obtained via questionnaires, in relation to critical success factors on fifteen key elements (i.e. a comprehensive strategy, technology standards, organisations process re-engineering, user interface, authentication and integration of the new e-procurement system, education and training, consent of stakeholders and stakeholders' performance, firm's size, centralized control and management, communication between participants, clear and achievable implementation, clear accountability for buying, close collaboration with suppliers, top management involvement and support and use of prototypes) is shown as follows.

Factors	Average	Rank	Consistency ratio (CR)
A comprehensive strategy	4.90%	9	6.60%
Technology standards	7.62%	7	
Organisations process re-engineering	2.88%	14	
User interface	5.24%	8	
Authentication and integration of the new e-procurement	4.62%	10	
Education and training	9.32%	6	
Consent of stakeholders and stakeholders' performance	2.96%	13	
Firm's size	10.58%	2	
Centralized control and management	10.38%	3	
Communication between participants	10.14%	4	
Clear and achievable implementation	3.94%	11	
Clear accountability for buying	3.16%	12	
Close collaboration with suppliers	10.14%	4	
Top management involvement and support	12.66%	1	
Use of prototype	1.48%	15	

Table 6.19: Critical Success Factors for the Adoption of E-procurement in AI-Amazon

From these figures, it is evident that top management involvement and support is considered the most critical factor, with an average percentage priority of 12.66%, as shown in Table 7.19. Firm size is ranked the second most important factor, with a percentage priority of 10.58%, which is very interesting and shows that the firm size has a significant impact on its adoption of technology. This has been mentioned by many other experts in their studies such as Patterson et al. (2003) and Lancioni et al. (2003) .



Organisation process re-engineering and use of prototypes were considered to be the least important factors in the company: this is due to its limited experience in the use of technology. A CR of 0.66 confirms the consistency of responses.

The interview statements of participants further confirm these findings. The head of AI-AI-Amazon, who is also the owner, described the situation as follows:

*“We cannot afford to invest money in overhauling the whole system and would prefer a solution that can run on the current system.”*

He also said:

*“Technical knowledge and expertise, particularly qualified IT personnel, are critical for successful implementation of e-procurement. As a small firm, we do not have abundant technical and monetary resources to have such people in sufficient numbers...Honestly speaking, our current technical infrastructure and human skills won't be enough to make e-procurement a viable solution for our organisation. Our procurement activities are limited and we don't need to invest a lot of money in e-procurement software and infrastructure development...To be honest,as a small organisation, we have limited monetary resources and would be interested in finding out the cost of the solution before we decide to adopt it. The organisation will be looking carefully at the long-term benefits of the solution and the cost of adoption as well as maintenance costs in order to make an adoption decision...Relatively bigger firms with more financial resources have some innovation in place and thus find e-procurement adoption easy, while smaller firms mostly follow traditional means of procurement and therefore find technological innovation much more difficult. Thus an analysis of prevailing work culture is very important.*

#### 6.1.4.1.5 Future Organisational Performance

In relation to the future impact of e-procurement adoption on firm's performance, the analysis of quantitative data obtained via questionnaires from Al-Amazon based on seven key elements (i.e. improved performance in terms of streamlining performance and reducing costs, e-procurement leads to sharing of information, short-term organizational performance, long-term organizational performance, improved cost performance in organization, organizational competitiveness and organization's revenue increment) is shown in Table 6.20, below.

Factors	Average	Rank	Consistency ratio (CR)
Improved performance in terms of streamlining performance and reducing cost	7.70%	6	4.97%
E-procurement leads to sharing of information	6.32%	7	
Short-term organizational performance	14.58%	4	
Long-term organizational performance	21.07%	2	
Improved cost performance in organization	21.50%	1	
Organizational competitiveness	15.65%	3	
Organization's revenue increment	13.15%	5	

Table 6.20: Future Impact of E-procurement Adoption in Al-Amazon

From these figures, it is evident that improvement in the cost of performance is ranked the highest, with a percentage priority of 21.50%, and long-term organizational performance is ranked second, with an average percentage priority of 21.07%. This shows that the respondents from the SME are aware of the fact that the impact of e-procurement on performance cannot be realised in a short term due to the initial cost of implementation. However, at the same time, there is a belief and awareness that the firm's cost of performance can be reduced and organisational competence can be improved. The empirical results indicate that the responses are consistent, with a CR of 0.49%.

These findings are further confirmed by the interview statements. For example, the head of Al-Amazon stated that:

*“Telephonic and fax communication are quite expensive and time consuming and also it is one-to-one communication. E-procurement allows multiple people to access information and communicates at the same time.”*

On the impact of e-procurement adoption on performance, he further stated that:

*“Obviously the impact on performance cannot be realised in the short term because the initial cost of adoption, training and others will be quite high, but it will definitely help the organisation to extend its current market and reach more people to generate more revenue in the long run.”*

#### **6.1.4.1.6 Culture Factors**

In regard to culture, the head of Al-Amazon also believed that culture has a vital impact on the current status and readiness of an organisation for the adoption of e-procurement:

*“To be honest, diffusion of innovative technology requires a specific favourable culture which is open to changes. Saudi Arabian culture is very positive in this regard and welcomes such changes, but only if they are sure about the benefits and it is not against the core values and norms of the society.”*

The head of Al-Amazon also believed that e-procurement adoption exerts a positive impact on prevailing organisational culture and is highly beneficial for the future of the organisation:

*“To be honest, to remain competent and survive in the current global business world, you must adopt innovative technology, because otherwise your organisation will not make the most of the people and customers. E-procurement leads to an innovative culture of working practices and leads to transparency and accountability.”*

The procurement staff of Al-Amazon also stated that:

*“A cultural change in the organisation is necessary for the adoption of e-procurement, which is a difficult task but very necessary for the future performance of an organisation.”*

Sales manager also stated that the business and the national environment of the country are quite challenging for SMEs:

*“To be honest, SMEs are finding it hard to flourish and adopt innovation in Saudi Arabia due to lack of government support, business culture, logistics and IT infrastructure and the availability of IT-skilled human resources.”*

#### **6.1.4.1.7 External Factors**

Al-Amazon is the smallest of all the companies and is not financially very sound. It has only one qualified IT person and the rest of the staff are not IT skilled and trained, which means that it has internal weaknesses; however, like the other SMEs, it is greatly affected by external factors. Even the financial weaknesses can be related to government and other financial institutes' lack of interest in providing loans to these SMEs to enable them to extend and grow their business. The interview participants mentioned quite a few external factors; for example, the head of Al-Amazon, while referring to the cost of the internet, stated that:

*“The high cost of broadband connection and reduced speed is not a motivating factor for SMEs’ adoption of e-procurement.”*

Thus, it is evident that Al-Amazon's future adoption of e-procurement is affected by internal as well as external factors.

#### **6.1.4.2 Summary**

Al-Amazon lacks technical and financial skills; however, the awareness and enthusiasm to adopt technology exists. The firm's top management are aware of the benefits that the technology could instil in their business and that it could help them to grow their business further. Similarly, they are aware of most of the barriers in the country that prohibit small SMEs from adopting e-procurement and other innovations. There is a positive attitude and perception regarding the impact of e-procurement on the company's future performance in the longer run. Similarly, the participants mentioned that although they have internal weaknesses, such as lack of financial resources and IT-skilled staff, these issues can be related to external factors such as lack of government help and support, the general scarcity of IT staff and the lack of training facilities in the country.

## **6.1.5 Case: 5: NWWC**

### **6.1.5.1 Introduction (Context of the Case Study)**

NWWC (North West Water Consortium) is a Riyadh-based company established by Abdullah Nasser Al-Mousa in 2008. In just a few years, it has become one of the leading SMEs in the region, specializing in water pumps and other associated accessories for public as well as private sector clients. The experienced and committed management is responsible for making it one of the best companies in the area in terms of providing technology-based solutions. The company has earned prestigious awards for its precise work, intellectual property portfolio and financial track record. It has been recognised for its excellent work by leading associations, experts and publications within the Kingdom of Saudi Arabia as well as abroad.

The company offers a range of products procured from pioneering European manufacturers with extensive experience in high quality water pumps. The company has procured a wide range of pumps for all sorts of water applications from these leading EU manufacturers. The company also offers a wide range of sewage pumps procured from Homa, a firm specializing in such solutions.

The company offers a wide variety of after-sale services to its clients to ensure the smooth running of the installed components during and after their warranty periods. The company representatives help in answering all customers' queries and troubleshooting their issues. The company has a modern state-of-the-art workshop in Riyadh run by a team of experienced and skilled engineers who offers full testing and inspection of equipment as per agreed schedules. The leading supplier partners, including Andritz, Hitachi and Franklin, also provide training and certification to the company's engineering team. The company has recently added a fully controlled test pit to its workshop so it can provide testing solutions to in-house as well outside customers for pumps and motors up to 4180v and 1000KW. The company has more than fifty distributors and nine branches throughout the country to efficiently serve its customers' needs, i.e. order placement, point of sale, merchandising programs and sales analysis.

The company has a huge warehouse in its headquarters in Riyadh with an area of 5,000 cubic meters, from which equipment and materials are distributed to smaller warehouses in each branch to serve the customers efficiently and effectively.

Unlike the other four SMEs, NWWC has adopted e-procurement and procures its products from renowned European firms such as Andritz, Hitachi and Franklin, as stated above. The firm uses Oracle people soft, which is a web-based acquisition system that allows employees of the procurement department to place track and manage orders while allowing the procurement manager to retain central control over the acquisition activities. This ensures that the employees are following the correct procedures and price agreements in every transaction they make.

Similarly, the company has highly skilled and qualified individuals to run the system and carry out the procurement process. The head and owner are qualified and well aware of the role of technology in their firm.

### 6.1.5.2 Perceived Barriers

In relation to the perceived barriers of e-procurement adoption the head and the owner of NWWC were interviewed and also asked to respond to AHP questionnaire on relative priorities of each of the barrier factor. They confirmed the presence of the following 12 barriers.

Factors	Average	Rank	Consistency ratio (CR)
Lack of Knowledge and Skills	5.15%	8	7.50%
Lack of appropriate infrastructure	15.65%	2	
Top management attitude	3.45%	11	
Lack of lack of trust	9.20%	5	
Lack of financial resources	3.35%	12	
Lack of interest or support from Government	16.85%	1	
Fear of change to a new system	7.30%	6	
Immaturity of technology	7.00%	7	
Incompatibility with ERP Systems	9.55%	4	
Insufficient financial support	5.00%	9	
Security concerns	13.00%	3	
Cost of implementation	4.50%	10	

Table 6.20: Perceived barriers to e-procurement adoption in NWWC

Further AHP analysis of their responses reveals that Government lack of interest and support is the most important barrier to the adoption of e-procurement, with a percentage priority of 16.85%, while lack of appropriate infrastructure and security concerns are the second and third most important barriers to the adoption of e-procurement in their view. The comparative priority of other perceived barriers is shown in Table 6.20.

The presence and importance of these barriers can be confirmed from the interview statements of the two respondents. The head (CEO) of the company, while referring to the lack of Government interest and support, stated that:

*“To be honest, Government support and interest is negligible. On paper, they do say that SMEs are important, but in reality they have not taken the steps they should have taken to promote SMEs’ business in the country. However, the recent decline in oil processes and economic issues in the country as a result of conflicts and chaos in the neighbouring Arab world has reignited the debate and we only hope that Government will extend their support to SMEs, but at the moment it is negligible”.*

The owner also understands that Government interest and support is minimal as far as the development of SMEs in the country is concerned.

They also felt that the current telecom and internet infrastructure is weaker in many areas of the country, especially in remote areas, and needs to be improved. In the owner’s words:

*“There is no doubt that the infrastructure has significantly improved in recent times and the Ministry of IT is putting a lot of interest into improving the general IT infrastructure, but they need to give attention to e-commerce and e-procurement specific infrastructure such as e-payment options, delivery systems and other cyber security and related business laws to make the adoption of e-procurement easy for firms”*

Referring to the security issues, the head of the company stated that:

*“Security is a big issue, to be honest, and our people in the kingdom are very hesitant in terms of the security of their personal and payment data. The*

*government needs to improve cyber laws and carry out awareness and encouragement campaigns to reassure people that their personal and payment information will not be compromised.*

Top management support, the cost of implementation and financial resources were the least important barriers for the company because the top management is well experienced and qualified and is aware of the importance of IT in the business and the company has a sound financial position and is able to spend money on implementing new and innovative solutions. The company did experience some compatibility issues when they were implementing e-procurement because their main database was running on MySQL and the computer terminal's processor and memory were insufficient for the new software, but was in a financial position to upgrade the entire system, as the head of the company mentioned in his interview statement:

*“We did experience incompatibility issues when installing the new Oracle people soft solution with the existing database and ERP system and had to upgrade from MySQL to Oracle database and also upgraded the computers to run smoothly and overcome any compatibility issues”*

One key finding from the company profile is that all of the suppliers are European-based and have adopted e-procurement solutions, so supplier willingness is not a big issue, but because they are based in a different country, timely delivery of products might be an issue at times.



## 6.1.6 Case: 6: IUT

### 6.1.6.1 Introduction (Context of the Case Study)

Mutlaq Al-Ghowari is a renowned construction contracting company in Saudi Arabia established in 1978. The company has successfully completed many projects in the country including bridges, underpasses, tunnels, roads, sewage projects, water transmission lines etc. The company, via its trading group "*International Unions for Trading Est*", distributes products such as LSAW pipes, Ductile Iron Pipes, HSAW pipes and Seamless pipes to all its clients throughout the Kingdom of Saudi Arabia. The company's pipes are of various types and fittings, with various diameters. The company has an active and efficient marketing and sales team that conducts surveys and markets and sells products in an effective manner in the Kingdom. Its major clients include the National Water Company, the Ministry of Housing and the Ministry of Water and Electricity.

The company mainly procures its products from its trading partner, Jindal SAW Ltd, a \$12 billion indigenous steel exporter and producer based in India, which is one of the first companies to use U-O-E technology to manufacture SAW pipes. Jindal SAW has a manufacturing plant in Abu Dabi UAE in addition to India, which makes it easy for the company to procure cheaper and high-quality products.

Like NWWC, the company is well established and financially sound, but it relies mostly on its trading partner, the Jindal group of India (a renowned steel magnet) for its key products, but does purchase additional products from suppliers in Europe and elsewhere. The company has well qualified and skilled individuals in its management and staff and is fully aware of the benefits of e-procurement. Like NWWC, it has also adopted e-procurement in the form of SAP\_ERP software solution.

### 6.1.6.2 Perceived Barriers

The author interviewed the owner and CEO of the company and they confirmed the presence of the following barriers to their adoption of e-procurement. The results were mostly similar to those of NWWC.

Factors	Average	Rank	Consistency ratio (CR)
Lack of Knowledge and Skills	5.00%	9	5.55%
Lack of appropriate infrastructure	15.60%	2	
Top management attitude	4.00%	12	
Lack of lack of trust	10.25%	4	
Lack of financial resources	4.00%	11	
Lack of interest or support from Government	17.70%	1	
Fear of change to a new system	5.85%	8	
Immaturity of technology	7.30%	6	
Incompatibility with ERP Systems	8.65%	5	
Insufficient financial support	5.90%	7	
Security concerns	11.60%	3	
Cost of implementation	4.20%	10	

Table 6.21: Perceived barriers to e-procurement adoption in IUT

The AHP analysis of their responses confirms that lack of Government support, inappropriate infrastructure and security concerns are respectively the top three barriers to the adoption of e-procurement in SMEs. While referring to the presence and importance of these barriers, the head of the company said:

*“Lack of Government interest and support is the biggest barrier because these SMEs do not have enough finances to develop a proper infrastructure and hire skilled people or even train their staff. However, government and financial companies mostly support big businesses”*

On problems with current infrastructure, the owner of the company stated that:

*“The infrastructure has quite a few issues; there are still a lot of areas that are not covered by cable and mobile internet and have poor telecommunication infrastructure. Even in areas covered by the internet, it is slow and not ideal for e-transactions. The e-payment options are limited, and to an extent are less reliable. The delivery system is slow and does not cover all areas due to the lack*

*of a postcode and house number system. However, in big cities, the infrastructure has improved significantly in recent times”*

The head of the company also mentioned that security is another key barrier:

*“People have doubts about security because the infrastructure is weak and cyber laws and regulations are either not present or not properly implemented and communicated to concerned individuals”*

The importance and presence of other barriers is shown in Table 6.21.

From the discussion with the company owner and CEO, and also from the profile, it is evident that compatibility was not a big issue because ERP\_SAP was compatible with their database and ERP system; however, they had to update their computer systems to ensure that they ran smoothly. The company staff and management are IT skilled and qualified and there has been no resistance to the adoption of e-procurement and other innovative technology. Similarly, supplier resistance was not an issue because the company procures 90% of its products from the Jindal group, with which the company has a trade union and which has adopted its own e-procurement system with their consultation, so that the systems are fully compatible.

## Overview of slected Cases

Name	Ahmed Bamarouf automotive	Khatib and Alami	Al-Maram	Raw Al-Amazon	NWWC (North West Water Consortium)	International Unions for Trading Est
<b>History</b>	It was established by Ahmed Bamarouf in 1945 in Jeddah and started selling Suzuki products in 1968 in the kingdom of Saudi Arabia.	It started its services in the kingdom of Saudi Arabia in 1984	Durrat Al-Maram was established in 1995 by Mr Soliman Al-Hamad	Raw Al-Amazon was established in 2000 by Mr Saleh bin Gishian	NWWC (North West Water Consortium) is a Riyadh-based company established by Abdullah Nasser Al-Mousa in 2008.	Mutlaq Al-Ghowari is a renowned construction contracting company in Saudi Arabia established in 1978
<b>BUSINESS TYPE</b>	Medium size	Medium size	Small size	Small size	Medium size	Medium size
<b>Products &amp; services</b>	The company deals in Suzuki cars and its related spare parts.	It deals in urban regional planning, engineering and architectural projects, and is famous for reliable project delivery, offering an integrated approach towards its clients	They are selling imported perfumes and cosmetics	The sell imported perfumes and other beauty goods	It deals in water pumps and other associated accessories	The company main products are LSAW pipes, Ductile Iron Pipes, HSAW pipes and Seamless pipes
<b>No of employees</b>	90	95	30	20	150	130

<p><b>e-procurement solution adopted</b></p>	<p>It procures its products from renowned bigger Suzuki suppliers in the country and sometime from abroad using phone, FAX and the internet. It has not yet adopted e-procurement but is we aware of its benefits and would like to adopt it soon.</p>	<p>It procures its products using, phone, FAX and sometime internet.</p>	<p>The company procure its products using traditional via phone and FAX. The company do sometime order products online by visiting their supplier's website that are based in other countries.</p>	<p>The company procure its products using traditional by visiting the bigger suppliers in the country and sometime place an order via phone and FAX. The company do sometime order products online by visiting their supplier's website that are based in other countries.</p>	<p>The firm has adopted complete e-procurement solution <b>Oracle people soft,</b></p>	<p>It uses SAP_ERP procurement software solution.</p>
<p><b>suppliers</b></p>	<p>Saudi Suzuki</p>	<p>suppliers based Europe firms</p>	<p>suppliers based America firms</p>	<p>suppliers based locally as well as foreign firms</p>	<p>Andritz, Hitachi and Franklin</p>	<p>Jindal SAW ltd</p>
<p><b>customers</b></p>	<p>local dealers and people</p>	<p>Government, public and private companies</p>	<p>Local shops</p>	<p>Local shops</p>	<p>Government, public and private companies</p>	<p>Government, public and private companies</p>

## 6.2 Cross-Case Analysis (Introduction)

The author carried out a cross-case analysis with an aim to compare the qualitative and quantitative findings for the four individual cases, identify the similarities and differences and investigate the reasons from the literature. The main objectives of cross-case analysis are listed below:

- To make a comparison of qualitative and quantitative findings of four selected cases and discuss them in the light of relevant literature;
- To discover the differences and similarities across the four selected cases using the GN (2009) model and justify it with reasons from literature.

### 6.2.1 Current Status and Readiness

In relation to current status and readiness, the analysis of quantitative data obtained via questionnaires regarding five key elements across all four selected SMEs (i.e. using the internet regularly in business, business having a website, qualified IT staff, current e-commerce model and the use of technology in the procurement process) is shown in Table 6.21 below. The table also shows the average ratio of the elements and their corresponding rankings as well as their consistency ratio.

#### 6.2.1.1 Quantitative Analysis

Factors	Case 1	Case2	Case3	Case 4	Average	Rank
Using the internet regularly in business	10.54%	7.41%	40.08%	41.68%	24.93%	2
Business has a website	21.96%	21.53%	10.17%	8.44%	15.53%	4
Qualified IT staff	9.25%	10.97%	26.68%	28.77%	18.92%	3
Current e-commerce model	16.80%	16.64%	8.30%	7.16%	12.23%	5
Use of technology in procurement process	40.65%	43.44%	14.77%	13.39%	28.06%	1
CR	7.08%	6.04%	3.47%	3.20%	4.95%	

Table 6.21: Current status and readiness across all four SMEs

The figures show that Ahmed Bamaroof and KA have the highest use of technology and therefore give it the highest importance for their e-procurement adoption, with an average priority of 40.65% and 43.44% respectively while in companies Al-Maram and Al-Amazon,

the use of technology is very low, at 14.77% and 13.39% respectively. Similarly, companies 1 and 2 have websites, whereas the other two companies do not. This is because the first two companies are medium enterprises with more financial resources and sales, while the latter are smaller, with limited resources, as mentioned earlier in the within-case introduction for each company. However, the presence of a website was declared half as important as the use of technology in all four SMEs. An average priority of 21.96%, 21.53%, 10.17% and 8.44% was assigned by the four SMEs respectively. Further companies 1 and 2 have an e-commerce model and consider it another very important factor for their adoption of e-procurement, which is not the case with the other two companies. Thus, in the light of relevant literature, it can be argued that companies 1 and 2 are in a better position than companies 3 and 4, as per Gunasekaran and Ngai, (2008, 2009), Azadegan and Teich (2010) and Veit et al. (2009). Companies 3 and 4 rely on their regular use of the internet in the premises as a valuable factor for their adoption of e-procurement, which shows their lack of skills and awareness. Companies 3 and 4 consider qualified staff very important for their adoption of e-procurement and gave it the highest priority, with scores of 26.68% and 28.77%, which is understandable because qualified staff demand high salaries due to the shortage of skilled IT personnel in the local market. Companies 1 and 2, which are financially sound and have some qualified staff, are not as worried about hiring them because they can afford higher wages.

### 6.2.1.2 Qualitative Analysis

Factors	Case 1	Case 2	Case 3	Case 4
Own website to communicate with customers	√	√	x	x
Current e-procurement activities within selected SMEs	√	√	√	x
EDI (phone, FAX, SMS and e-mail, social media etc) is the dominant procurement model (technology)	√	√	√	√
Use internet to look at information on other company's websites	√	√	√	√
Current Use of B2C, B2B and B2E Model (e-commerce model)	√	√	x	x
Human resources	√	√	x	x

**Table 6.22: Qualitative Comparison of the four SMEs**

The qualitative data in the table above confirm the absence of a website and an e-commerce model and lack of human resources in companies 3 and 4. In addition to the evaluation of Gunasekaran and Ngai's (2009) five key elements related to current status and readiness, two additional elements (current e-procurement activities within selected SMEs) were also found to be relevant and important for their adoption of e-procurement. The importance of current e-procurement activities is supported by the findings of Patrizio et al. (2004), who stated that existing electronic activities help in improving people's skills and abilities and make the uptake of e-procurement easy.



## 6.2.2 Perceived Benefits

In relation to perceived benefits of e-procurement adoption in the four selected Saudi Arabian SMEs, the analysis of quantitative data regarding fourteen key elements (i.e. better utilization of staff, efficiencies increment, help to improve SCM, improved existing markets, improved relationships with suppliers, improved customer service levels, increased customer satisfaction, increased market share, reduction in inventory levels, reduction in non-contractual buying, reduction in operational tasks, reduction in processing time, reduction in transactional cost and support for environmental issues) is shown in Table 6.23 below. The table further shows the average ranking and consistency ratio. The table has been submitted as a part of Author's publication in "The GAI International Academic Conference Proceedings Istanbul, Turkey", under the Title "Evaluation and Investigation into the Potential Benefits of e-Procurement Adoption in Saudi Arabian SMEs" in 2015).

### 6.2.2.1 Quantitative Analysis

Factors	Case 1	Case2	Case3	Case 4	Average	Rank
Better utilization of staff	6.85%	5.50%	5.37%	4.48%	5.55%	9
Efficiencies increment	3.52%	3.38%	3.12%	3.96%	3.50%	12
Help to improve SCM	13.41%	11.99%	10.07%	13.66%	12.28%	2
Improved existing markets	3.22%	6.72%	8.12%	15.26%	8.33%	5
Improved relationships with suppliers	12.15%	9.66%	7.10%	7.92%	9.21%	4
Increased customer service	6.78%	8.03%	7.35%	6.74%	7.23%	6
Customer satisfaction	5.81%	5.81%	7.57%	5.84%	6.26%	7
Increased market share	4.26%	4.25%	3.55%	7.68%	4.94%	10
Reduction in inventory levels	7.49%	7.45%	4.50%	4.86%	6.08%	8
Reduction in non-contractual buying	4.18%	3.68%	3.55%	3.26%	3.67%	11
Reduction in operational tasks	3.55%	3.31%	3.30%	3.00%	3.29%	13
Reduction in processing time	8.44%	12.03%	12.95%	9.96%	10.85%	3
Reduction in transactional cost	12.47%	16.25%	12.75%	11.48%	13.24%	1
Support for environmental issues	1.88%	1.94%	1.77%	1.80%	1.85%	14
CR	7.75%	7.84%	7.65%	7.78%	7.76%	

Table 6.23: Quantitative Analysis of Perceived Benefits Across the Four SMEs

These figures show that there is a good awareness of all the perceived benefits mentioned in the Gunasekaran and Ngai (2009) model; however, some benefits were found to be more

important than others and vice versa in other SMEs. The data shows that improvements in supply chain management, reductions in transactional cost and improved relationships with suppliers were the top three benefits in companies 1 and 2, with a corresponding average priority of 13.41%, 12.47% and 12.15 in company 1 and 11.99%, 16.25% and 9.66% in company 2 respectively. The results also show that improvement in supply chain management and reduction in transaction cost were also realised and found to be very important in companies 3 and 4: along with reduction in processing time and improvement in their existing market, these were the most important perceived benefits for the adoption of e-procurement, as can be seen in the figures in Table 6.23. Improvements in the existing market were given less importance, with an average priority of 3.22% and 6.72% respectively in companies 1 and 2: this is due to their current monopoly in the existing market, meaning that they would rather try to extend to other markets in the country or even abroad to other Middle East countries. Companies 3 and 4, being smaller, would like to strengthen themselves in their current market as a result of future e-procurement adoption and associated a rather higher priority with this element: i.e. 8.12% and 15.26% respectively. Support for environmental issues was given the least importance across all four selected SMEs, which might be due to the lack of awareness about environmental issues and corporate social responsibility in the country. The results are very consistent, as is depicted by the average consistency of these aforementioned elements across all four selected SMEs.

### 6.2.2.2 Qualitative Analysis

Perceived Benefit	Case1	Case2	Case3	Case4
Cost effectiveness	√	√	√	√
Time saving	√	√	√	√
Increased staff efficiency and utilisation	√	√	√	√
Business expansion to wider supplier base	√	√	√	√
Reduced disruptions in supply chain	√	√	√	√
Improved relationship with suppliers and partners	√	√	√	√
Less paperwork: environmentally friendly	√	√	x	x
Improved customer loyalty and trust	√	√	√	√
Increased transparency	√	√	√	x

Table 6.24: Perceived Benefits – Comparative Qualitative Analysis

Qualitative data found nine key perceived benefits overall, of which eight were similar to the quantitative data, while an additional factor (increased transparency) was also found. Increases in market share, reduction in inventory levels, reduction in non-contractual cost and reduction in operational tasks were not found by the qualitative study across the four selected SMEs. Companies 3 and 4 did not realise the importance of reduced paperwork as a perceived benefit due to their smaller scope and less paperwork being used.

As per Renna and Argoneto (2010), Walker and Brammer (2012), Pereira (2009) and Teo et al. (2009), it can be deduced that there is a good realisation of the perceived benefits of e-procurement adoption in selected Saudi Arabian SMEs; however, the key benefits are realised to a greater extent in companies 1 and 2, which have more skilled and qualified people and wider business scope, and to a lesser extent in the smaller SMEs (i.e. companies 3 and 4) due to their lack of skilled and qualified human resources and their smaller business scope. Thus it can be deduced that all benefits of e-procurement are not yet realised in SMEs and thus the government should increase its efforts to raise awareness and provide training programs to help firms realise the benefits and encourage them to adopt e-procurement.

### 6.2.3 Perceived Barriers

In relation to perceived barriers to e-procurement adoption in selected Saudi Arabian SMEs, the analysis of quantitative data obtained via questionnaires regarding twelve key elements (i.e.lack of knowledge and skills, lack of appropriate infrastructure, top management attitude and lack of trust,lack of financial resources, lack of interest or support from Government, fear of change to a new system, immaturity of technology, incompatibility with ERP systems, insufficient financial support, security concerns, cost of implementation) is shown in Table 6.25, below. The table also shows the average priority ratio of each element within each of the four selected SME and the ranking of the elements as well as the average and overall consistency of the responses.

#### 6.2.3.1 Quantitative Analysis

Factors	Case 1	Case2	Case3	Case 4	Case5	Case 6	Average	Rank
Lack of knowledge and Skills	9.97%	9.57%	12.09%	12.25%	5.15%	5.00%	9.01%	4
Lack of appropriate infrastructure	16.90%	14.52%	7.81%	8.17%	15.65%	15.60%	13.11%	2
Top management attitude	3.14%	3.55%	3.36%	3.05%	3.45%	4.00%	3.43%	13
Lack of trust	5.53%	8.12%	7.21%	6.30%	9.20%	10.25%	7.77%	6
Lack of financial resources	3.60%	4.12%	15.53%	15.58%	3.35%	4.00%	7.70%	7
Lack of interest or support from Government	14.97%	15.47%	13.57%	14.17%	16.85%	17.70%	15.46%	1
Fear of change into a new system	6.65%	4.61%	3.81%	3.55%	7.30%	5.85%	5.30%	12
Immaturity of technology	9.01%	10.26%	6.19%	4.83%	7.00%	7.30%	7.43%	8
Incompatibility with ERP systems	8.47%	6.47%	4.31%	3.88%	9.55%	8.65%	6.89%	9
Insufficient financial support	4.84%	6.98%	6.94%	5.75%	5.00%	5.90%	5.90%	11
Security concerns	12.58%	11.03%	9.40%	9.80%	13.00%	11.60%	11.24%	3
Cost of implementation	4.36%	5.32%	9.77%	12.70%	4.50%	4.20%	6.81%	10
CR	8.34%	8.47%	8.88%	8.95%	7.50%	5.55%	7.95%	

**Table 6.25: Perceived Barriers to E-procurement Adoption – Quantitative Comparison Across all four SMEs**

Comparative quantitative analysis of four cases reveals that government lack of interest and support, lack of appropriate infrastructure and lack of appropriate security standards were the top barriers to e-procurement adoption within these selected SMEs, as shown in Figure 6.25. Management of the first two companies (i.e. Ahmed Bemarouf and KA) is technically

and financially moderate and shows interest in e-procurement adoption. They are willing to adopt e-procurement provided that they are given appropriate financial support by the government, and also if the infrastructure improves, securities issues are addressed and procurement-related laws are implemented by the government. Suppliers' willingness and readiness will be an issue, particularly for KA, which relies on local suppliers. For Ahmed Bemarouf, however, this might not be a big issue, as it procures from suppliers in foreign countries.

The last two companies, NWWC and IUT, have already adopted e-procurement and use Oracle and ERP\_SAP for this purpose. However, they also feel that government support and lack of appropriate infrastructure are key issues in SMEs' adoption of e-procurement. Due to their good financial positions and association with renowned suppliers abroad, they do not encounter many problems with suppliers' willingness to adopt e-procurement, particularly in the case of NWWC, which procures from well established European suppliers. However, they did complain about the speed of broadband, which sometimes create problems in procuring products, and the weaknesses in terms of postal addresses, which delays the delivery of products when needed. The qualitative analysis in Table 6.26 confirms the presence of these barriers and denotes barriers that are less important for the companies with a cross. The analysis reveals that the majority of the barriers mentioned by GN (2009) also affect the adoption of e-procurement in Saudi Arabian SMEs; however, their priorities and relative importance vary slightly.

### 6.2.3.2 Qualitative Analysis

Perceived Barriers	Case1	Case2	Case3	Case4	Case5	Case6
Weaker ICT infrastructure	√	√	√	√	√	√
Lack of Government support	√	√	√	√	√	√
Lack of IT skills and Knowledge	√	√	√	√	√	√
Absence e-procurement specific laws and regulations	√	√	√	√	√	√
Lack of trust in electronic transfer of funds	√	√	√	√	√	√
Lack of financial resources	x	x	√	√	x	x
Lack of top management support	x	x	√	√	x	x
Own postal addresses and delivery service	√	√	√	√	√	√
Secure and trustworthy online payment options	√	√	√	√	√	√
Supplier's willingness and readiness to participate	√	√	√	√	x	√

Table 6.26: Perceived Barriers – Qualitative Analysis

Qualitative data found seven perceived barriers of e-procurement in relation to selected Saudi Arabian SMEs, while elements such as fear of change to a new system, immaturity of technology, and cost of implementation were not found, either due to less knowledge and experience of the procurement technology or because they were not important in the Saudi Arabian context. However, the former makes more sense, because they are important barriers that can be realised by people with adequate previous experience, but people in these SMEs lacked this practical experience of e-procurement adoption. Further, it is evident from the qualitative elements in the table that lack of top management support and lack of financial resources was not a problem in companies 1 and 2 but did affect companies 3 and 4, confirming the quantitative findings. Thus it can be deduced that barriers to e-procurement adoption were mostly realised but due to lack of knowledge and skills, awareness of technology and practical experience in e-procurement adoption among SME personnel, some of the barriers were not found in the qualitative data. As in the GN (2009) study, it was found that NWWC (case 5) found incompatibility an issue in the adoption of e-procurement (Oracle people soft solution): for example, their existing MYSQL database and some other hardware and software were incompatible. However, this was not the case with IUT (case 6), which adopted ERP-SAP. The other companies did not comment much on

incompatibility and fear of change, possibly due to their lesser knowledge or awareness, as they have not yet adopted e-procurement.

#### 6.2.4 Perceived Critical Success Factors

On perceived critical success factors of e-procurement adoption, the analysis of quantitative data obtained from four selected SMEs on fifteen key factors (i.e.a comprehensive strategy, technology standards, organisation’s process re-engineering, user interface, authentication and integration of the new e-procurement system, education and training, consent of stakeholders and stakeholders’ performance, firm’s size, centralized control and management, communication between participants, clear and achievable implementation, clear accountability for buying, close collaboration with suppliers, top management involvement and support and use of prototype) is shown below. The table shows the average priority of each of the fifteen key elements adopted from GN (2009) as well as wider e-procurement literature and their ranking to identify the most important elements.

##### 6.2.4.1 Quantitative Analysis

Factors	Case 1	Case 2	Case 3	Case 4	Average	Rank
<b>Comprehensive strategy</b>	5.99%	5.00%	5.48%	4.90%	5.47%	9
<b>Technology standards</b>	8.40%	7.59%	7.90%	7.62%	7.98%	6
<b>Organisation’s process re-engineering</b>	3.72%	3.89%	3.38%	2.88%	3.52%	14
<b>User interface</b>	7.25%	5.93%	5.47%	5.24%	6.23%	8
<b>Authentication and integration of the new e-procurement system</b>	3.85%	3.60%	5.93%	4.62%	4.37%	11
<b>Education and training</b>	8.85%	9.83%	10.12%	9.32%	9.39%	3
<b>Consent of stakeholders and perform stakeholders</b>	4.08%	3.98%	3.55%	2.92%	3.72%	13
<b>Firm’s size</b>	8.63%	8.24%	6.72%	10.58%	8.56%	4
<b>Centralized control and management</b>	4.03%	11.39%	6.53%	10.38%	7.27%	7
<b>Communication between participants</b>	7.11%	6.65%	11.25%	10.14%	8.45%	5
<b>Clear and achievable implementation</b>	5.23%	4.09%	3.80%	3.94%	4.46%	10
<b>Clear accountability for buying</b>	4.39%	3.97%	3.35%	3.16%	3.85%	12
<b>Close collaboration with suppliers</b>	12.17%	10.44%	11.40%	10.14%	11.26%	2
<b>Top management involvement and support</b>	14.08%	12.61%	13.62%	12.66%	13.41%	1
<b>Use of prototype</b>	2.25%	1.87%	1.62%	1.48%	1.89%	15
<b>CR</b>	7.60%	7.15%	7.60%	6.60%	7.31%	

**Table 6.27: Critical Success Factors**

From these figures, it is evident that top management support and involvement and collaboration with suppliers were the two most critical factors for the future adoption of e-procurement across all four selected SMEs, with a corresponding average priority of 14.08%, 12.61%, 13.62%, 12.66%, 13.41% and 12.17%, 10.44%, 11.40%, 10.14%, 11.26% respectively. This is to be expected: as discussed earlier in the literature, top management in Saudi Arabian SMEs are mostly the owners, who makes all key decisions, including the adoption of technology. Due to their lack of technical skills, the situation becomes very complicated: therefore, it is vital to convince and persuade them by telling them about the various benefits of e-procurement adoption. Firm’s size was another very important factor for the SMEs’ adoption of e-procurement. Studies on the adoption of technology, particularly in the Arabian Gulf, have found that the firm’s size is vital for the adoption of innovative technology. Previous researchers such as Straub et al. (2002), Khalil (2011) and Cheung et al. (2013) have particularly stressed that organisations that have more skilled people, especially in the top management, are better shaped for the adoption of e-procurement. This, however, as mentioned earlier, is not the case in Saudi Arabian SMEs, as they suffer from a lack of knowledge and skills, which affects their technological adoption. Another key critical factor is training and education to equip personnel with the required skills and needed for the adoption of e-procurement.

**6.2.4.2 Qualitative Analysis**

CSFs	Case1	Case2	Case3	Case4
Integration and compatibility with current system	√	√	√	X
Use of prototype and gradual implementation	√	√	√	√
Support and involvement of top management	√	√	√	√
Involvement of all stakeholders	√	√	√	√
Qualified and skilled IT personnel in the organisation	√	√	X	X
Functionality and viability of the solution	√	√	√	√
Cost benefit analysis of the solution	√	√	√	√
Technical maturity of marketplace	√	√	√	√
User-friendliness of the solution	√	√	√	√
Good monitoring, training and learning	√	√	√	√

**Table 4.28: Perceived Critical Success Factors – Qualitative Analysis**

The qualitative data in the table above confirm most of the key critical success factors in the literature and the Gunasekaran and Ngai (2009) model. Some of the elements of the original



model were not found relevant which could be attributed to lack of practical experience and knowledge of e-procurement. Some additional factors were also found, such as cost benefit analysis of the solution, which is clearly due to the fact that the smaller SMEs lack financial resources and do not get the required financial help from the government to adopt innovative technology. Similarly, the technical maturity of the market was another critical factor revealed by the qualitative analysis, which shows that the Saudi Arabian market is not yet mature enough for the smooth adoption of innovative technology. Thus it can be deduced that most of the critical success factors are similar to those reported in the literature, but there are some additional factors that are specific to the adoption of e-procurement in the Saudi Arabian environment.

## 6.2.5 Perceived Future Organisational Performance

On perceived future organisational performance, the analysis of quantitative data obtained via questionnaires from selected Saudi Arabian SMEs in relation to six key factors (i.e. improved performance in terms of streamlining and reducing cost, e-procurement leads to sharing of information, short-term organizational performance, long-term organizational performance, improved cost performance in organization, organizational competitiveness and organization's revenue increment) selected from the Gunasekaran and Ngai (2009) model and the wider e-procurement literature is shown in the table below. Average priority, ranking and consistency ratio are also shown in order to distinguish the overall consistency of participants' responses and the relative importance of these factors.

### 6.2.5.1 Quantitative Analysis

Factors	Case 1	Case 2	Case 3	Case 4	Average	Rank
Improved performance in terms of streamlining processing	8.60%	9.55%	7.49%	7.70%	8.34%	6
E-procurement leads to sharing of information	7.29%	9.02%	7.56%	6.32%	7.55%	7
Short-term organisational performance	7.09%	9.68%	13.83%	14.58%	11.30%	5
Long-term organisational performance	20.32%	23.80%	19.13%	21.07%	21.08%	2
Improved cost performance in organisation	22.43%	19.60%	22.04%	21.50%	21.39%	1
Organisational competitiveness	21.11%	19.03%	18.10%	15.65%	18.47%	3
Organisation's revenue increase	13.21%	9.31%	11.83%	13.15%	11.88%	4
CR	3.87%	3.81%	6.76%	4.97%		

Table 6.29: Perceived future organisational performance – quantitative analysis

From the analysis, it is evident that improvements in cost performance and long-term organisational performance were the two most important elements for the selected Saudi Arabian SMEs with regard to their future performance as a result of e-procurement adoption, with corresponding priority scores of 22.43%, 19.60%, 22.04%, 21.50% and 21.39% respectively. Information sharing and streamlining performance were found to have less priority as far as future performance is concerned. Sharing of information can also be

related to security concerns, as mentioned earlier, because people do not have much trust in current security infrastructure. The results are thus consistent with previous studies where due to lack of training and skills of employees, there is slight decline in performance. Further, the initial cost of implementation affects short-term profit and revenue.

#### 6.2.5.2 Qualitative Analysis

Future organisational performance	Case1	Case2	Case3	Case4
<b>Improved communication with customers and suppliers</b>	√	√	√	√
<b>Reduced overall purchasing cost and saves time</b>	√	√	√	√
<b>Increased competitiveness</b>	√	√	√	√
<b>Strategic alliance and networking</b>	√	√	<b>X</b>	<b>X</b>
<b>Short-term organisational performance</b>	√	√	√	√
<b>Long-term organisational performance</b>	√	√	√	√
<b>Knowledge management and data warehousing</b>	√	√	<b>X</b>	<b>X</b>

Table 6.30: Future organisational performance – qualitative analysis

Qualitative analysis confirms the quantitative findings and additionally reveals two other very important elements, namely knowledge management and data warehousing and changed business and working culture of the organisation. Knowledge management and data warehousing are very important and allow businesses to access previous information to bring improvements in future. The adoption of e-procurement and any other sort of innovation transforms the business and working culture of the organisation: i.e. people interact with each other online instead of using the phone or walking to them, there is less use of paper and updates can occur in real time. Strategic alliance and networking and knowledge management elements were not found in companies 3 and 4 due to their smaller size and scope and their lack of technological knowledge and experience. It is often considered that ICT adoption requires a specific organisational culture; however, the converse is also true in that ICT shapes a future organisational culture that can dramatically change the business performance landscape. E-procurement adoption leads to a culture of collaboration and free flow of information, making virtual corporation and networking a reality (Alazzawi, 2011). It allows people to work from home with comfort, thereby increasing the performance and productivity of the organisation. Collaboration and networking allow staff to provide support in complex decision-making because they can see how procurement activities take place (Chen and Huang, 2009).

It can be deduced that most of the elements related to future organisational performance in the Gunasekaran and Ngai (2009) model were found to be relevant and some additional elements were also found. Change in the business and working culture of the organisation was found to be a very important element for the adoption of e-procurement.

## 6.2.6 Perceived Culture Factors

### 6.2.6.1 Qualitative Analysis

Perceived Culture Factors	Case 1	Case 2	Case 3	Case 4
Organisational Culture	√	√	√	√
Cultural Inertia	√	√	√	√
Business environment and national culture of the country	√	√	√	√

Table 6.31: Perceived Culture Factors – Qualitative Analysis

The importance of organisational culture is evident from other studies, such as the works of Straub et al. (2002), Khalil (2011) and Cheung et al. (2013), and the findings are thus consistent with the e-procurement literature. According to Lakemond et al (2013), organisational culture affects how tasks are carried out around the firm and penetrates deep into every aspect of the firm’s life. Janicijevic (2012) have, for example, mentioned that employees’ reaction to change strongly depends on the organisation’s existing culture. Other aspects related to current status and readiness that are impacted by the organisation’s culture are participation and support of staff and management, communication, working habits and prevailing organisational norms, because these are all impacted by changes (Wanberg and Banas, 2000). Drzensky et al. (2012) have noted that individuals within an organisation are influenced and affected by their social surroundings: i.e. their reaction to change is very much dependant on the existing norms of the organisation. Lakemond et al (2013) has noted that organisational culture acts as an adhesive, bonding individuals and groups with the organisational readiness, and is carried and shared by all individuals collectively. Heracleous (2001) states that organisational culture has a vital role in the organisation’s current status and readiness for change such as the acceptance of new technology. Similarly, organisational culture shows how every

individual or group carries out their activities in the organisation and how they are going to be impacted by change (i.e. adoption of new technology such as e-procurement: Janicijevic, 2012). Drzensky et al. (2012) believe that acceptance of new technology and change in organisational working is incorporated deep into organisational culture and has the potential to determine whether new technology is accepted or rejected. Thus the impact of culture on the current status and readiness of Saudi Arabian SMEs is vital for the successful adoption of e-procurement.

Cultural inertia was another key barrier to the adoption of e-procurement. The work practices that people follow over the years cannot easily be changed because they originate from people's traditions, working norms, expectations and background. Therefore, for a smooth transition to e-procurement, it is necessary that people's perception of technology is changed via education, training and other awareness practices. People's broader culture and perception need to be changed because various stakeholders, such as suppliers, customers, partners and others, must all have a positive attitude towards the adoption so that it is successful. Further, it is evident that cultural challenges and barriers exist where people are unable to accept technology due to their habits, social customs and religious beliefs. However, this is only one aspect of cultural inertia: another aspect involves issues such as the disappearance of jobs that could otherwise be done with minimum education (Alawi et al., 2007). When considering the social and cultural barriers to the adoption of e-procurement and other ICT applications, one needs to look at the underlying reasons: some of these reasons that are specific to the Arab culture include lack of technical skills and education, contents of various products that are contrary to religious beliefs, lack of awareness about the benefits of technology, people's habit of not taking responsibility and lastly a general perception that things are hard to change. However, with education, awareness, trust and better infrastructure, these cultural barriers can be mitigated (Alawi et al., 2007).

Culture is a vital element in directing individuals and organisations towards the adoption of e-procurement. Park et al. (2004) stated that the critical nature of organisational culture is due to the fact that it is a way of transferring new techniques and ways of solving problems to new members in the organisation. A feasible cultural environment is therefore needed in the organisation in order for these cultural traits to be transferred. Alawi et al. (2007) stated

that the feasibility of an organisation's culture for the adoption of e-procurement and other ICT depends on human behavioural and cultural dimensions of Hofstede's model. Lai and Lee (2007) also found that organisation culture is critical and can act as either an enabler or a hindrance to the successful adoption of e-procurement. Alawi et al. (2007) mentioned many cultural barriers to the adoption of e-procurement and other ICT technologies; however, Tseng (2010) has found that cultural characteristics such as the perception of productivity and quality, trust and innovation contribute to the successful adoption of e-procurement. Similarly, Park et al. (2004) found a positive correlation between adoption of technology and cultural characteristics such as trust, flexibility, stability and support from various stakeholders in the organisation (SME). Alawi et al. (2007) also found a positive relationship between ICT adoption and culture of willingness, collaboration and trust in the organisation. The present study also provides empirical evidence that there is a positive relationship between the cultural characteristics of an organisation and its adoption of e-procurement.

## 6.2.7 Perceived External Factors

The analysis of qualitative data obtained from the selected Saudi Arabian SMEs found that external factors were more influential in the adoption of e-procurement than the internal factors within each of these selected SMEs. The key external factors found across all four selected SMEs are shown in the table below.

### 6.2.7.1 Qualitative Analysis

7. Table 6.32: Perceived External factors – Qualitative Analysis

Perceived External Factors	Case 1	Case 2	Case 3	Case 4
Government Support	√	√	√	√
Low cost and high speed internet connection	√	√	√	√
Competitor's pressure	√	X	√	√

As is evident from the above findings, competitive pressure was not a critical factor for companies 1 and 2 because they are quite big, financially sound and there is no other company in the country to compete with them or exert pressure on them. Government support was found to be the first and one of the most important factors for the adoption of e-procurement as stated by majority of the interview participants. They mentioned various different ways such as the improvement of infrastructure, laws and regulations, intellectual property protection, financial support, education programme and promotion of ICT usage etc in their interview statements that are related to the government and positively influence SMEs adoption of e-procurement.

The role of government in e-procurement adoption has been discussed extensively in literature. (Chan et al., 2012) has confirmed this in their study stating that, It is very common across the business world to look for government support, and the same is the case for Saudi Arabian SMEs. One main reason for government support is that it enhances people's trust in online business and they feel more secure (Chen and McQueen, 2008).

### **6.3 Summary**

From the cross-case analysis, it is evident that bigger SMEs such as companies 1 and 2 qualify for basic level readiness of e-procurement adoption, unlike companies 3 and 4, which lack the basic skills and resources needed. There is good awareness of the benefits of e-procurement adoption across all SMEs, particularly those with more financial resources, such as companies 3 and 4. A number of inhibiting factors were identified that hinder Saudi Arabian SMEs' adoption of e-procurement, and they are mostly related to the lack of government interest and efforts, such as inadequate provision of financial resources, lack of high-speed internet and other technological infrastructure, lack of awareness, lack of technical education and most importantly lack of policies and regulations. The analysis thus found that external factors affect SMEs' adoption of e-procurement more than internal factors. One of the key external factors found by the study was the role of countries' business and national culture and its impact on SMEs' adoption of e-procurement.



## Chapter Seven

### 7 Discussion

#### 7.3 Introduction

This chapter presents a discussion on the findings of the study conducted on Saudi Arabian SMEs to investigate factors affecting the adoption of e-procurement. First, the findings of the qualitative analysis, obtained via interviews across four selected SMEs, are discussed in detail, followed by the AHP findings from the quantitative data obtained via questionnaires. This is followed by a comparison between the findings from the qualitative and quantitative data analysis to discuss the similarities and differences in detail with reference to the Gunasekaran and Ngai (2009) model. Furthermore, after discussing the qualitative and quantitative analysis, the chapter attempts to satisfy the research objectives and the related research questions.

#### 7.4 Quantitative findings

In this section, the results of the quantitative analysis of data obtained from selected Saudi Arabian SMEs and analysed using AHP are discussed and reviewed in the light of existing literature to assess and provide a framework for the most important factors.

On a broader level the study found that Barrier factor was found the most important for the adoption of e-procurement with average priority of 35%, followed by current status and readiness with an average priority of 29% as shown in table 6.2. This is in line with the previous studies of Kamhawi (2008) on e-commerce adoption in Bahrain, where he found that unless the risk and lack of trust factors are not overcome management in Arab firms won't be ready to invest in the adoption of sophisticated technology and current status is also related to the lack of risk in the use of a technology. It can also be confirmed from the study findings of Al-Ghaith et al (2010) and Alshehri and Drew (2010), who both stressed on overcoming the challenges and barriers in order to realise the benefits of technology. Perceived benefits with an average priority of 21% were ranked 3<sup>rd</sup> while Critical success factor and organisational performance with an average priority of 7% and 5% respectively

were found relatively less important. It however can be argued that management will look at critical factors and future performance once, the key challenges and risk are overcome and benefits are fully realised.

The importance of individual factors and their respective elements are discussed as follows.

#### **7.4.1 Current status and readiness**

In the pilot study (Appendix A), the author established that all of the SMEs investigated in this research were aware of the importance of technology, the internet and e-procurement (two had their own website and the other two were using the internet regularly). However, the internet and websites were used only for providing information to customers and no actual e-commerce transactions were taking place. The objective of establishing firms' current status was, however, partially met in the pilot study. The objective here was to further explore the e-readiness of Saudi Arabian SMEs and to identify the factors that are most important (i.e. the ones that take firms a step nearer) to the adoption of e-procurement. Adapted from the work of Gunasekaran and Ngai (2009), Cofriyanti and Hidayanto (2013) and broader literature on e-procurement, the research decided on five important factors (i.e. using the internet regularly in business, the business having a website, qualified IT staff, having a current e-commerce model and the use of technology in the procurement process) to include in the questionnaire for assessment from the respondents in selected Saudi Arabian SMEs. In terms of current status and readiness, the AHP analysis of five factors (see Table 6.6 to Table 6.10) reveals that the use of technology for the procurement process, which falls in the EDI (Electronic data exchange tools) domain, such as using fax and e-mail for electronic transfer of data between customers and suppliers, was ranked the most important by the respondents, with an average score of 28.06%. According to Gunasekaran and Ngai (2009), this falls within the e-business domain and acts as a support and foundation for the adoption of e-commerce or e-procurement. Similarly, In and Le (2005) state that the extent of EDI depicts the firm's technical abilities and experience with ICT tools. Regular use of the internet is ranked second, with a rating of 24.93%, which is an indication of respondents' awareness about the importance of the internet for procurement activities, as discussed by Teo et al. (2009). Qualified staff, the business having a website and current e-commerce model were also found to be important,

but to a lesser extent, with average ratings of 18.92%, 15.53% and 12.23% respectively. The respondents' results from across the four selected SMEs were consistent, with a CR of 4.95%.

The Saudi Arabian SMEs thus qualify for a basic level of readiness because they use EDI for data exchange and communication with various stakeholders and regularly use the internet for procurement-related activities (Gunasekaran and Ngai, 2008;Azadegan and Teich, 2010).Veit et al. (2009) believe that SMEs that are accustomed to electronic data exchange and use of the internet in their business activities demonstrates a basic level of readiness for innovation and the adoption of e-procurement because not much more is required in this regard.

#### **7.4.2 Perceived Benefits**

The 2<sup>nd</sup> research objective is related to the evaluation benefits and barriers elements to e-procurement adoption. In this section the author examines the benefits elements of e-procurement adoption in selected Saudi Arabian SMEs. Based on the GN(2009) study and broader e-procurement literature, the study found fourteen key barriers elements which were then subjected to AHP analysis on a scale of 1-9. The analysis of data as shown in tables 6.11 to 6.15 reveals that with somewhat variation in priorities the benefits of e-procurement adoption were realised in all selected SMEs. Further the analysis shows that efficient use of time in transaction and management of supply chain were the two most important benefits of e-procurement adoption in selected Saudi Arabian SMEs.

As per Eei et al (2012) and GN (2009), the realisation of these benefits elements shows that SMEs in Saudi Arabia are closer to e-procurement adoption.

### 7.4.3 Perceived Barriers

This section examines the second part of the second objective, which is concerned with the evaluation of perceived barriers to e-procurement adoption. The research tested twelve barriers adapted from a wide literature on e-procurement and tested on a nine-point AHP Scale. The results are shown in Tables 6.16 to 6.20. The analysis reveals that lack of government support is the biggest perceived barrier, with an average rating of 15.46%, as shown in Table 6.20. This complements the findings of Alfaadhel (2011) and Al-Somali et al. (2013), who established that SMEs are getting less financial help from government and also indirectly from financial institutes due to legislative hurdles. Government support is particularly needed in terms of finances, which is evident from the lack financial resources (7.70%). The second barrier, lack of infrastructure, with an average rating of 13.11%, is also related partially to the efforts of the government and partially to lack of technical skills in the SMEs, which is evident from the third barrier, i.e. lack of knowledge and skills, with an average rating of 10.97%. Barriers such as top management support (3.43%) and lack of trust (6.79%) show that SMEs are willing to implement e-procurement once these external barriers (government-related and lack of skilled people) are removed. This argument is further strengthened by another question in the pilot study, where 100% of respondents believed that e-procurement is important and increases the efficiency and effectiveness of organisations. Unlike the findings reported by Gunasekaran and Ngai (2009), in which there were more internal issues such as fear of change and technology immaturity, here the external barriers are given top priority.

The analysis further shows that only two of the elected 6 companies, namely NWWC and IUT have implemented e-procurement in the form of Oracle people soft and SAP-ERP. As the research has already established that financial position of the SMEs and availability of skilled people is vital for the adoption, these two companies are better in these two aspects and are associated with renowned supplier who have already implemented e-procurement i.e. NWWC procure its water treatment equipments from popular Europe and US brands while IUT is associated with the popular Indian Steel magnet the Jindal group.

#### **7.4.4 Critical success factors**

This section examines the quantitative data regarding the most critical factors for the adoption of e-procurement, which is the third objective of the study. Adapted from the broader e-procurement literature, fifteen critical factors were tested on a nine-point scale and subjected to AHP Analysis. The results are tabulated in Tables 6.21 to 6.25 of Chapter 6. The analysis reveals that top management support and involvement is the most critical factor, with an average rating of 13.41%, as shown in Table 6.25. This further clarifies the fact that top management in SMEs is mostly the owner him/herself who makes all the important decisions, especially those involving finances (Al-Somali et al, 2013). The critical nature of top management involvement is agreed by the broader e-procurement adoption literature on SMEs and is in line with the findings of Gunasekaran and Ngai(2009), Aman and Kasimin (2011) and others. Close collaboration with suppliers was the second most critical factor, with an average rating of 11.26%, which is to be expected because the success of e-procurement depends on the effectiveness and cooperation of suppliers, which form the other end of the e-procurement process. Education and training forms the third critical success factor, with an average rating of 9.39%: this is also to be expected, because there is a lack of people who are skilled and knowledgeable in the field of technology, as demonstrated in the section on barriers. Firm's size constitutes the fourth critical factor, which is important in two ways. Firstly, as discussed by Hollenstein and Woeter (2008), smaller firms have fewer technical and human resources, and this is particularly relevant in the Saudi Arabian context, as reported by Al-Somali et al. (2013), Alfaadhel (2011) and Ghobakhloo et al. (2012). However, secondly, there is a positive perspective in regard to SMEs' adoption of technology, as discussed by Tan et al. (2007) and Li and Xie (2012), who stated that unlike larger firms, SMEs have less inertia to change and an SME with flexible management can adjust to a changing environment quickly and easily in the wake of competition and other external pressures. Communication between participants is the fifth most critical factor, with an average rating of 8.45%. This again is very obvious, because like suppliers, participants (stakeholders and partners) determine the effectiveness of the adoption. Technology standards and centralized control and management are the sixth (7.98%) and seventh (7.27%) most critical factors. Centralised control and management, as discussed by Dameri et al. (2012), is important because it will increase transparency,

security and accountability in the system. Dameri and colleagues further stated that centralised control also increases the security of the system. The remaining factors, with an average rating below 6%, are in the lower half of the hierarchy as far as the critical nature of factors is concerned and are relatively less important.

#### **7.4.5 Future organisational performance**

This section examines the fourth and last objective of this study, which is related to the perceived future performance of Saudi Arabian SMEs. The respondents were asked to select, on a scale of 1 to 9, the most important of seven factors (which were selected from the broader e-procurement literature) in relation to the future performance of the organisation if e-procurement were implemented. The responses were analysed using AHP and results are presented in Tables 6.26 to 6.30 in Chapter 6. The analysis reveals that improved cost of performance in organisations is the most important factor, with an average rating of 21.39%, as shown in Table 6.30. This is to be expected, because cost and financial resources are important for SMEs, and as discussed by Hsin et al. (2013), e-procurement has potentially reduced cost in performance due to low response time and process efficiency. The data further reveal that long-term organisational performance, with an average rating of 21.08%, is this second most important factor in this regard, but is only slightly behind the first factor. This is a sign of stronger faith in the ability of e-procurement to improve performance, as opposed to the findings reported by Gunasekaran and Ngai (2009), in which there was a great deal of uncertainty in the responses. It is also in line with the findings of Theodosiou et al. (2012). Organisational competitiveness, with an average rating of 18.21%, is the third most important factor, in line with Duan et al. (2012). Organisational revenue increase and short-term organisational performance are the fourth and fifth most important factors, with average ratings of 11.88% and 11.30% respectively. Gupta et al. (2012) found a relationship between increased revenue and e-procurement adoption. Cho et al. (2012) found that order processing, delivery service, customer satisfaction and demand management, which are all short-term benefits, improved as a result of e-procurement adoption. Hong and Kwon (2012) found that process efficiency and system flexibility, along with better customer service and customer satisfaction, can be achieved as a result of e-procurement adoption. The remaining factors have average ratings of below ten and are thus less important.

#### 7.4.6 Summary of quantitative Findings

The analysis of quantitative data on a broader term reveals that Barrier factor of the GN (2009) model is the most important for the adoption of e-procurement followed by current status and readiness and then perceived benefits, while critical success factors and future organisational performance were found less important for the adoption of e-procurement in selected Saudi Arabian SMEs. Further the detailed analysis of individual factor's elements revealed that in relation to current status and readiness, the study found that Saudi Arabian SMEs qualify for a basic level readiness and the results showed that Saudi Arabian SMEs were slightly behind the southeast Coast USA SMEs. Two of the four selected SMEs were not having a website, which was an important factor in Southeast Coast SMEs.

In terms of benefits the study found that e-procurement adoption is closely related to the reduction in procurement and transactional (processing) cost, increases the efficiency of business and greatly help in improving SCM (Supply chain Management). The priority (importance) of benefits factors were slightly different from Gunasekran and Ngai(2009) but all benefits mentioned in Gunasekran and Ngai(2009) and broader e-procurement literature were also found in Saudi Arabian SMEs. Unlike Gunasekaran and Ngai (2009) where improvement in relation with suppliers and customer and better utilisation of staff had respective higher priority, Saudi Arabian SMEs were more interested in reduction of cost , improvement in supply chain and reduction in processing time.

The study found that Unlike Gunasekaran and Ngai (2009) model lack of government support and lack of infrastructure were the biggest barriers as compare to *"fear to change"* and *"immaturity of technology"*. *Lack of skills and knowledge* had comparable priority in both cases. There were more security concerns regarding the use of technology in Saudi Arabian SMEs as compare to Southeast cost USA. Further it was also revealed that the two SMEs who adopted e-procurement did face compatibility issues with existing database and ERP system of the organisation which is obvious because most SMEs run outdated softwares and will need to upgrade not only the software but also the hardware (computers) when they decide to adopt e-procurement.

From above it is evident that the role of Government is very crucial for the adoption of e-procurement in Saudi Arabian SMEs. Government need to further develop the

infrastructure, improve ICT education in schools colleges and universities, and improve payment system, make e-procurement related legislation and laws, remove hurdles in getting faineances by SMEs and above all increase awareness and encourage the use of innovative technology by people and organisations.

### **7.5 Qualitative data findings**

In this section, the qualitative data obtained via interviews with staff of four selected SMEs is discussed in the light of existing literature on e-procurement.

#### **7.5.1 Current status and readiness**

From the analysis of interview responses in Chapter 5, it is evident that there are six key factors, namely the company having its own website, current e-procurement activities, current e-procurement technology (EDI), use of the internet in procurement, current business model and human resources, that the respondents believe are important for the adoption of e-procurement. The first important factor was the presence of a website. Only two of the four selected SMEs have their own websites, but the majority of the respondents believe that this is positively related to the adoption of e-procurement: for example, the head of the IT department in Ahmed Bamaroof said:

*“Websites gives control to the organisation to keep everything in their hands such as maintenance, security, payment and other transactional issues, and since staff get used to such things, e-procurement adoption is smoother”*

This is in line with the findings of Brestschneider et al. (2007), who state that websites can be easily controlled from anywhere in the world and are more secure for transactions and electronic payments, and that e-procurement can be easily integrated into an existing website.

Further, it was evident that the degree of innovation and services offered by the website is related to the adoption of e-procurement: i.e. a website where electronic buying and selling takes place will have more a positive effect on the adoption of e-procurement than a website which merely advertises the company, as stated in the interview statement of the head of IT in Ahmed Bamaroof:



*“The effectiveness of a website for e-procurement depends on the number of services it offers. This means that if a website is more innovative and offers more services, such as online buying and payment, etc., its role in e-procurement is more evident than a normal website. The five key services a website must offer in order to be considered highly effective in e-procurement readiness include emerging services, integrated services and enhanced interactive services. Our website offers emerging or enhanced services”.*

These arguments are supported by the existing e-procurement literature, such as Maheshwari et al. (2009), who found that a more innovative website has a stronger relationship with e-procurement adoption due to the range of services it offers. Maheshwari et al. (2009) further stated that companies with innovative websites have staff that are used to activities similar to e-procurement application and thus require less training. Further, the ASPA (2008) study has suggested five key services that a website must offer in order to be considered highly effective in e-procurement readiness, which include emerging services, integrated services and enhanced interactive services. Thus one can easily conclude that companies that have their own websites are better prepared for the adoption of e-procurement than those that do not.

Current electronic activities in the procurement process are related to the future uptake of full e-procurement solutions, which is to be expected because people will have a taste of it and will be ready for it in terms of training and having seen some of the benefits. This is evident from the statement of a respondent in KA:

*“Such similar activities expose people within the organisation to practical knowledge and hands-on experience, which is handy when the actual process is adopted later.”*

This is supported by the findings of Patrizio et al. (2004), who stated that existing electronic activities help in improving people’s skills and abilities and make the uptake of e-procurement easy.

Similarly, it was found that EDI was the dominant tool used by the SMEs for electronic exchange of data, which is good sign, because as per Chong et al. (2009) and Oliveira

&Martins (2011), innovative e-procurement has evolved from these traditional EDI tools, such as phone, e-mail and fax. Smart (2010), however, understands that EDI is an initial stage in e-procurement and indicates that organisations are a long way away from adopting web-based e-procurement. Chong et al. (2009) and Liu (2007) also understand that EDI is an initial stage in modern e-procurement adoption.

The use of EDI confirms two things: firstly, there is some realisation of e-procurement within the SMEs, and secondly, it is at a very early stage and more needs to be done to materialise the adoption of full e-procurement.

Another factor mentioned by the respondents was the use of the internet. Respondents from across all SMEs mentioned that they regularly used the internet for various different activities, which, as discussed by Gamal Aboelmaged (2010), helps greatly in the realisation of the need for innovative web-based e-procurement. Gebauer et al. (1998) state that the use of the internet can be a positive compelling factor in the adoption of a full web-based e-procurement solution. They further state that the use of the internet and other web-based technologies has the ability to transform organisations' mindset from traditional paper-based process to web-based procurement solutions.

The other factor in relation to current status and readiness that can be related to the future adoption of e-procurement is the current business model of the SMEs. Two of the selected SMEs – KA and Ahmed Bamaroof – were using B2C and B2B (Merchant Model), while the other two did not engage in e-business and did not mention any model. Chang and Graham(2012) has mentioned that e-business models provide a foundation upon which all e-activities such as e-procurement can be based and thus are very relevant to the adoption of e-procurement.

The last factor mentioned by the respondents was related to human resources. Two of the SMEs (Suzuki and KA) mentioned that they had trained and skilled IT personnel but the majority of them were expatriates, indicating that the local market is low on human skills: this is a negative sign as far as the adoption of e-procurement is concerned. This is evident from the interview statement of the head of Saudi AL-MARAM

*“It is difficult for us to hire professional IT staff due to low finances because they are rare in the Saudi market and demand a high salary.”*

Azab et al. (2009) and Bakry (2005) stated that human resources are the key to the successful adoption of e-procurement and countries that are low on skilled IT personnel find the adoption of e-procurement difficult. Thus, one can conclude that more efforts are required on the part of government and companies to provide IT training and education if e-procurement adoption is to be materialised.

### **7.5.2 Perceived Benefits**

The analysis of qualitative data in chapter 5 reveals nine key benefits that the selected Saudi Arabian SMEs perceive that they would obtain from the adoption of e-procurement. These benefits are cost effectiveness, increased efficiency and utilisation of staff, business expansion, less disruption in the supply chain, time saving, strengthened relationships with suppliers and partners, less paperwork and environmental friendliness, increased customer loyalty and trust and increase transparency.

Majority of the study respondents stated that e-procurement is an efficient and cost effective option for SMEs purchasing practices e.g. the head of procurement in KA stated that

*“E-procurement is a valuable tool and can decrease clerical work to a great extent, thereby reducing the overheads of writing, updating and maintaining papers.”*

This finding is similar to many previous studies e.g. Bertot et al(2010)state that e-procurement makes the purchasing process transparent and open for the company and eradicate any corrupt practices which saves money. Teo (2009) understands that e-procurement is instrumental in saving cost for the company because it significantly reduces paper work, searching for products and other overhead and administrative cost. From Chang and Wong (2010) it is evident that transactional cost is greatly reduced and valuable time is saved by e-procurement. Dooley and purchase (2009) found that cost can be

reduced by up to 65% by e-procurement via eradication of paperwork, human hours required, accuracy in orders and real time tracking.

It is, however, worth mentioning here that the extent of cost-effectiveness depends on the size and type of the organisation, as is evident from the interview statement from the head of Al-Maram:

*“Historically e-procurement is a very cost effective tool that reduces communication cost, transactional cost and other overhead costs such as clerical work and use of papers or using other expensive communication methods, but for an organisation like ours, where the sales are not very big, the initial cost can be quite high and sometimes not affordable, but in the long term it will allow us to increase our market and business.”*

This is strongly supported by the literature of e-procurement: for example, Trkman and McCormack (2010) stated that the extent of cost saving for an organisation depends on the volume of its purchases: in other words, the size of the SME and its business type.

Further, the analysis reveals that staff efficiency and utilisation are greatly boosted by the adoption of e-procurement. Referring to the reason for this, the head of Suzuki stated that:

*“E-procurement speeds up the process by making communication quicker and also allows people from various departments to work in parallel instead of sitting idle and waiting for someone else to finish their work.”*

This is also highlighted by many researchers in their findings, such as Choi (2014), who has found a positive relationship between staff utilisation and e-procurement adoption. Dooley and Purchase (2009) and Ronchi et al. (2010) have also found a positive relationship between staff utilisation and e-procurement adoption by SMEs. Xu (2014) and Cauyan (2010) have further clarified the way e-procurement increases staff utilisation and efficiency by stating that it allows staff to work from anywhere and do several tasks at the same time (multitasking), and reduces travelling and fuel usage by staff, as they can work from home.

Study participants discussed the importance e-procurement by stating that it provides competitive edge to the company and allowing it to increase its customer base by going beyond geographical boundaries.

For example, a member of marketing department stated as follows:

*“Traditional businesses have very limited local supplier base, while e-procurement allows businesses to have a wider supplier base and can thus choose a supplier with the best product or service at the lowest possible price. This allows business to increase its profit margin and also to offer product in lower price to its customer thereby obtaining competitive advantage over other SMEs”.*

These findings are consistent with the findings of Change et al (2010) who also believe that it allow companies to eradicate supplier monopoly by exposing itself to wider supplier pool and chose the best product with least prices. Renna and Argoneto (2010) have found that e-procurement increases business opportunities by widening customers as well as supplier base. Similarly Walker and Brammer (2012) and Pereira (2009) found that e-procurement provides competitive edge to businesses in the market.

It was also found that SMEs can benefit from a reduction in supply chain disruption because it will no longer take hours to receive an update on a product and then further to inform all the departments: instead, this will happen in real time and all departments will receive an update at the same time. The reason for this reduction in delay was mentioned by a few interviewees in their statements. For example, the head of procurement in KA explained it in the following words:

*“E-procurement allows businesses to check their products and services orders and their status 24/7 and eradicate any delays in communication that otherwise happen in traditional procurement, and this increases business transaction speed and ultimately leads to better customer service”.*

This factor is also mentioned in the e-procurement literature and many researchers believe that with e-procurement, firms operate in a more efficient manner. Smith (2009)

and Baghalian et al. (2013) view e-procurement as an efficient tool that works in a real-time and transparent manner and provides all stakeholders with updates about problems and actions that can be taken to resolve them quickly. Chong et al. (2009) stated that e-procurement allows all stakeholders to become synchronised and connected in a single process, making information flow effortless, smoother and more transparent, and actions can be taken quickly, whether the order needs to be changed or the firm needs to switch to another supplier if it cannot be supplied within a time limit, or otherwise to ask the customer if he can wait for a bit longer. Ngai et al. (2009) stated that disruption in the supply chain has severe consequences, such as losing customers and reputation, and also affects the relationship between the business and its suppliers. However, e-procurement makes things more transparent and factors causing reduction can be addressed promptly, as it operates 24/7.

The cost of a product and to get it in time to be delivered to the customers is key to the success of any business. “A stitch in time saves nine” holds true for the success of any business. The efficient use of time and reduction in cost via e-procurement adoption were mentioned by many study participants from across the selected SMEs. The head of Ahmed Bemarouf for example stated that

*“In a manual system when you have to purchase an item, the procurement staff search through a lot of various different catalogues and visits many different websites for the product needed. After they decide on a product, the procurement staff fill out the purchasing forms and submit them for approval to the head of procurement. The process takes a lot of people and it takes weeks for the entire process to be completed”.*

Efficient use of time through e-procurement adoption is also evident from wider literature e.g. Samuel and Spalanzai (2009) has stated that e-procurement allow information to be communicated quickly amongst stakeholders thereby allowing them to make any necessary updates and insure timely delivery of products. Parida and Sophonthummapharn (2010) have also stated that e-procurement makes information flow almost in real time and

keeping every one up to date to insure timely supply of products/Services. Chong et al (2009) has stated that e-procurement allow stakeholders to take any necessary action at anytime from anywhere to make sure products are delivered on time and have satisfied customers. Beghalian et al (2013) stated that time is very valuable in business e.g. he stated that if a customer has placed an order for Christmas, if delivered after Christmas will have no value for customers.

Further, the analysis revealed that e-procurement can improve the relationship between the business and its suppliers and partners. However, this was mentioned by only a few interview participants, which might be because this is not a direct benefit for the firm (Teo et al., 2009;Chau and Hu, 2001). Some of the characteristics of e-procurement that lead to improvement in relationships with suppliers were mentioned in an interview statement by the head of Ahmed Bamaroof :

*“E-procurement provides a great opportunity for the SMEs to improve relationships with suppliers by making sure that there is greater transparency and visibility and less errors or delay in order of products, which further make the business work with the same accuracy with its customers and other partners, and overall business trust and integrity increases.”*

There was a positive response to the improvement in the relationships between the business and its suppliers. Dooly et al. (2009) stated that in business, reputation is very important: it is built over a long period of time and neither the business nor the supplier would want lose it. They further stated that e-procurement adds more accountability, transparency and visibility to the procurement process and minimises misunderstanding,thus strengthening relationships. Chong et al. (2009) and Cauyan(2010) have also found that e-procurement brings collaboration and integration into the procurement process where a business has reasons to stay with a supplier and the relationship is strengthened. Walker (2013)and Veit et al. (2011)have found that better relations with suppliersrepresent a long-term strategic benefit that businesses can achieve through the adoption of e-procurement.

The analysis revealed that e-procurement reduces the amount of paperwork, which has a dual impact: i.e. reduction in cost and environmentally friendly (less cutting down of trees).The head of Ahmed Bamaroof was quoted as follows:

*“E-procurement will facilitate a paperless office where all communication will take place in digital format and information will be saved in digital form on the computer for later use.”*

He went on to say:

*“In the modern era, businesses are expected to be socially responsible and one of our corporate social responsibilities is to help in facilitating a green environment. E-procurement and digital communication will transfer most procurement activities into paperless form, such as e-tendering, e-bidding etc.”*

In the literature, the cost factor associated with reduced paperwork is widely discussed: for example, Panayiotou et al. (2004), Albrecht et al. (2005), Engstrom (2009), Dawes (2008) and Johnson (2011) have all mentioned that reduced paperwork and administrative work helps organisations to overcome overhead costs and is highly beneficial. Walker and Brammer (2012) established a relationship between e-procurement and CSR (“Corporate Social Responsibility), but missed the environmental impact of the adoption of e-procurement.

Customer is key to the success of any business. A satisfied customer guarantees the success of any business (Walsh et al, 2009). They further stated that e-procurement has the potential to strengthen the bond between the business and its customers by keeping them well informed of the progress or any delay so they can take any necessary actions. The head of Ahmed Bamaroof explained it as follows

*“In the absence of e-procurement, it takes ages for customer queries to be passed to the supplier and feedback to be given to the customers, but e-procurement allows it to be done in real-time by passing those queries on for a direct response by the supplier, resulting in a satisfied and loyal customer”.*

Similarly, the head of KA stated that:



*“Customer service is the biggest source of competitive advantage in the current fast-paced business world where many organisations offer similar products at similar prices. Making sure that customers obtain their products on time makes them happy and loyal, which e-procurement make possible because it allow business to acquire the product quickly and then send it quickly to the customers too,”*

These findings are in line with the model, theory and broader e-procurement literature e.g. change and Wang (2010) in their research found that supplier, businesses and customers are brought closer together by e-procurement although they are physically over long distances, thereby increasing customer loyalty and transparency in the business. Andreu et al (2010) and Horppu et al (2008) found that e-procurement increases trust between the stakeholders because they can track the status of order at any time and overall there is greater transparency. There is less chance of misunderstanding and the relationship thus gets stronger. Johnson et al (2011) through his research establishes that e-procurement allow customers to leave feedback about their experience about the product and is very useful for the future of the business. Baghalian (2013) and Chong et al (2009) understand that the benefit of e-procurement is its impact on customers' loyalty and satisfaction as they can track and are aware of the status of their order at any point in time. Walker's (2012) views are also similar in his research and has stated that the feedback can be a useful entity in data mining for future of the business.

The analysis of data obtained from interview participants reveals that e-procurement is vital for eradicating corrupt practices and bringing transparency in business of the SMEs. The head of KA therefore stated as follows

*“Transparency and visibility of actions will allow departments to see the status of an activity by another department and they can quickly communicate digitally to make it faster and provide and ask for help and co-operation if needed too.”*

These findings can be confirmed from previous literature on e-procurement. Bertot et al (2010) and Tai et al (2010) have both confirmed that e-procurement leads to better transparency and discourages corrupt practices in businesses. Transparency in business is very important and many researchers have highlighted it in their findings such as Doolet et al (2009) who has stated that it improves the relationship of business with partners and suppliers. Shim and Eom et al (2008) and Carlo and Bertot et al (2012) have stated that e-procurement facilitates executives monitoring of business operations. Albrecht et al. (2005) have found that e-procurement is a promising tool in establishing transparency and accountability.

Increased transparency in firms' processing also was mentioned by the interview participants. As an example, the head of procurement in Ahmed Bamarooof was quoted as saying:

*"E-procurement can improve transparency by reducing collusion among bidders and eradicating corruption by making bidding information visible to a wider pool of interested suppliers. Participation of a large number of firms will break the monopoly of local firms. Corruption can be mitigated by preventing the withholding of information by government officials and other people and making it clearly visible to all parties."*

E-procurement's ability to bring transparency to firms' supply chain has widespread acceptance in the e-procurement literature. Anderson (2009) stated that e-procurement allows for transparency in bidding, and thereby allows accountability and eradicates price fixing. Similarly, Betroth et al. (2010) found that e-procurement eliminates collusive bidding and corruption and ensures greater transparency in the supply chain, which they regard as a relationship-strengthening factor between suppliers and the firm. Mahmood (2010) and Kaliannan et al. (2009) found that e-procurement overcomes the inherent weaknesses of reduced negotiation and transparency in traditional procurement systems and leads to greater accountability and transparency. Gordon (2009) understands that greater transparency achieved via e-procurement adoption leads to better and more factual pricing and reduced transaction timings.

### 7.5.3 Perceived Barriers

The analysis of qualitative data obtained from four selected SMEs revealed that there are five key barriers to the adoption of e-procurement. These barriers are weaker infrastructure, lack of government support, lack of IT knowledge and skills, absence of laws and regulations specific to e-procurement, and people's and businesses' lack of trust in electronic fund transfers.

The first barrier mentioned by the interview participants was weaker IT infrastructure, as is evident from the interview statements of the majority of the respondents, such as head of Saudi Suzuki, who states that:

*"The internet is very slow and needs further improvement to meet the needs of e-procurement"*

This is consistent with the literature findings, in which lack of reliable (strong) infrastructure is strongly emphasized for the adoption of e-procurement: for example Laryea and Ibem (2014), in their study in South Africa, found that 46% of participants rated it as one of the biggest barriers to the adoption of e-procurement.

If weaker infrastructure is a barrier, then obviously if people do not have access at all to IT infrastructure, they will be unable to adopt e-procurement. The study reveals that there are still areas where people have no access to the internet and other IT infrastructure that is important for the adoption of e-procurement, as the head of Ahmed Bamarooof mentioned:

*"In spite of the government efforts, there are still areas where the internet is either not available or very slow and too unstable to meet the needs of e-commerce activities."*

Eidie et al. (2007), in their study in Ireland, found that lack of sufficient IT infrastructure is one of the biggest hurdles in the adoption of e-procurement, and three years later in another study in the UK, Edie (2010) found the same to be true, which complements the above statement that lack of access to IT infrastructure is the biggest barrier to the adoption of e-procurement. Similarly, Oyediran and Akintola (2011), in their study on sixty-six

contractors in Nigeria, found that lack of insufficient IT infrastructure poses key hurdles in the adoption of e-procurement.

Explaining the ingredients of sufficient and reliable ICT infrastructure, the head of Ahmed Bemarouf stated that:

*“The infrastructure, including the availability and speed of the internet, the regulatory framework, e-payments and the availability of IT skilled staff in the country, is at a preliminary stage and must be improved to fulfil the needs of e-procurement and other e-commerce solutions.”*

Laryea and Ibem (2014) also mentioned most of these factors constituting a stronger and reliable infrastructure. Similarly, Ghobakhloo et al. (2012) and Nguyen (2015) also mentioned many of these factors as essential parts of the ICT infrastructure that are necessary for the successful adoption of e-procurement.

Laryea and Ibem (2014) argue that there is a greater chance of increase in e-procurement adoption if the infrastructure improves: the same can be said for Saudi Arabian SMEs. As discussed by Al-Ghamidi et al. (2012), the ICT Infrastructure in Saudi Arabia is improving as more young people are being provided with scholarships to study abroad, universities within the country are increasing and IT is on the priority list. Al-Ghamidi et al. (2012) further stated that internet and telecommunication coverage has extended to remote areas and has improved in quality. Weaker ICT infrastructure is therefore negatively related to the adoption of e-procurement in Saudi Arabian SMEs.

Lack of government support was another barrier mentioned by the majority of the interview participants. The head of KA, providing some figures, described it as follows:

*“In Saudi Arabia, financiers and commerce banks avoid lending to SMEs, which is evident from the fact that the debt capital for SMEs is less than 2% of the country.”*

He also stated that:

*“The training institutes are very expensive in the country and charge up to \$3000 for a short course in accounting or IT.”*

Support from government and other financial agencies is very important for growth and innovation of SMEs, as discussed by Eei (2012): in his study on the adoption of e-procurement in Malaysian SMEs, he found that IT innovations in SMEs are largely dependent on external factors, of which government is the most dominant. Similarly, Laryea et al. (2014) stated that government support is the most influential factor in e-procurement adoption by both SMEs and their suppliers. Al-Hudhaif and Alkubeyyer (2011) stated that SMEs not only need financial support from government but also need government to facilitate SMEs' adoption of e-procurement by making policies and regulations that are conducive to this process. Al-Hudhaif and Alkubeyyer (2011) further stated that in Saudi Arabia, people have more trust in initiatives that come from the government: therefore, more serious steps need to be taken by the government of Saudi Arabia.

Another important factor mentioned by majority of the interview participants across four selected Saudi Arabian SMEs for the adoption of procurement owned postal address and delivery services in the country. They understood that without unique postal addresses and efficient delivery services e-procurement adoption is very difficult. This can be confirmed by the interview statements of the participants. For example the head of procurement department in KA expressed his views regarding this as follows

*“Obviously owning postal address and delivery services is vital for any e-commerce activity including e-procurement. This is a key external factor which is not in the hand of SMEs and greatly influences the adoption of e-procurement. Weaknesses in postal services and postal addresses have a negative influence on the adoption of e-procurement in the country”*

(Belanger and Hiller, 2006) confirms this by stating that a secure and trusted postal service is the backbone for the success of e-business, including e-procurement, because it ensures that goods are delivered within the timeframe required and in the right condition. Similarly (Alfuraih, 2008) has stated that in Saudi Arabia, if a company or an individual wants to receive mails and parcels, they will need to subscribe to mail boxes in the post office

The head of IT department in Ahmed Bamarroof mentioned that there have been some positive steps by the government in this regard which ease the adoption of e-procurement in the future. He expressed his views as follows

*“E-procurement and other e-commerce activities rely greatly on efficient postal and delivery system. Saudi Arabia has recently started the use of GIS (Geographical information system) in the country to establish postal system and has divided the country into various different regions but more work is needed to encourage SMEs and other firm’s adoption of e-procurement”*

He further stated that

*“Although these initiatives are good but the progress is very slow and will take some time before it can be effectively used”*

Saudi Post understood the importance of delivering to buildings and houses in 2005 and thus started a project which was duly approved and appreciated by the government (Saudi post, 2008 and Alfuraih, 2008). The ‘Wasel’ post and delivery service operates throughout Saudi Arabia and provides a variety of options for customers to receive their parcels. Customers can subscribe to the ‘Wasel’ postal service by visiting their office or online from home or office. Letters are delivered free via this service but there is a special charge for parcels and other deliveries. The ‘Wasel’ Postal service provides six different delivery options for customers to choose from, including delivery with an e-stamp, e-mail notification about the parcel status and safe keeping. The service covers the country’s major cities, where most SMEs are situated, but there is a need to extend it further to some remote areas in the future. Currently nearly a million customers, including companies and individuals, have subscribed to various Wasel services (Alriyadh, 2013).

Lack of financial support and lack of IT skills and training by government are particularly important for smaller SMEs that are struggling, as was stated by the head of Al-Amazon:

*“Honestly, we do not have money to train our staff, because the training institutes are very expensive and are also not up to the international standards in*

*terms of training and education. We want government to invest more in SMEs in the form of training and development and by establishing cheaper or free training institutes, because SMEs play a key role in the economy”.*

The government is therefore not only expected to provide direct support to SMEs but also to create legislation to allow other financial agencies to support them. Further, the government is expected to set up cheap training institutes that can provide support to SMEs’ employees and staff. Laryea (2014) found in his study in South Africa that lack of clear and definite government policy is a key hurdle in the limited adoption of e-procurement in SMEs.

Secure online payment means are extremely important for all e-business activities including e-procurement and this is very much evident from the interview statements of the participants. Majority of participants stated that people must have trust in these payment ways and must be protected from all sort of scams. This can be confirmed by the interview statement of the head of Ahmed Bamaroof who stated that

*“Customers (individual and businesses) submit transactions via online payment gateways and the security of those gateways is very important. Customer must have trust in those options and they must be aware of cyber crime particularly phishing and spoofing. SADAD has built some reputation in Saudi but further improvements and alternative means are needed”*

According to Beynon-Davies (2013), online payment is a key requirement for e-procurement and other e-business activities. A credit card is a key requirement of online payment which is not easy to get from Saudi Banks, because they are only given to people who have a specific monthly income which is deposited directly into the bank (AlGhamdi et al., 2011). AlGhamdi and colleagues further state that most companies prefer to receive payments via a credit card as opposed to a debit card because they can be cashed easily and there is less chance of fraud in payments. Security of payments is one key issue the on part of customers, whether individuals or companies (AlGhamdi et al., 2011).

Deputy Head of Ahmed Bamaroof also considered it an extremely important factor. He expressed his views about it as follows

*“It is very obvious that until and unless you do not have secure payment gateways, e-procurement cannot be successful and of course it is not in the hands of SMEs. So the government legislative cover and efficiency of the payment gateway companies have a vital role to play in this regard”*

Similarly the head of KA understands that secure payment options are very otherwise customer, SMEs, Supplier and the economy will be at stake. He further stated that

*“Secure online payment options are very vital because otherwise all stakeholders and the overall economy of the country will be at stake because of spoofing and online fraud”.*

He further stated that

*“Customer must be aware and educated about various payment options and risk in it so that they can protect themselves from fake websites and other online frauds. Market place people must be trained and latest technology must be used to reduce various cyber crimes”*

Another very important aspect of online payment was identified by the head of IT in Ahmed Bamaroof who stated that

*“People hack your personal information including payment card details, name and address and use it later to make a transaction which not only give you financial loss but can also put you in other sort of troubles, therefore, market place executives, businesses and people must be aware of these things and must adopt all sorts of protective procedures to keep themselves secure”*

This lack of trust along with people understanding and being comfortable with the English interface creates a lot of problems e.g. Brdesess (2013) believe that the interface of online transactions on the company website is a major concern in such online transactions. Many people in Saudi Arabia either do not understand or do not feel comfortable with English and prefer to have an Arabic interface, as this will make their jobs quicker and easier because they will not have to spend time decoding the terminology (Alrawy and Sabry, 2009).

Another important barrier to the adoption of e-procurement in Saudi Arabian SMEs that was mentioned by the respondents was the lack of IT skills and knowledge. This is evident from the interview statement of the head of Ahmed Bamaroof, who states that:



*“Most of our technical staff, especially IT personnel, are expatriates (Indian, Egyptian, Pakistani etc.) because there are very few local qualified IT personnel and they demand higher salaries. The government has recently invested a lot in providing scholarships to local people and establishing IT universities, but it will take at least a decade for these local professionals to be available in the market”.*

Kannabiran and Dharmalingam (2012) stated that advanced and innovative technologies are largely adopted by larger corporations because they have more money and can afford to hire skilled people and pay them huge salaries. Notably, previous studies by Eadie et al. (2007), Isikdag et al. (2011), Laryea and Ibem (2014) and Badran (2014) all declared procurement-related knowledge as well as general IT skills and knowledge to be extremely important for the adoption of e-procurement and have thus asserted that deficiency in this regard will pose a major barrier to the adoption of e-procurement. From the interview statements, it is clear that local industry has a lack of qualified IT staff and organisations rely on expatriates to fill the gap, but in order for the industry to stand on its own feet, local qualified staff are needed (Ramasamy, 2013; Carayannis, 2014). Johnson et al. (2013) stated that people’s IT knowledge and skills engender awareness about the benefits of e-procurement and lead to mass uptake of the technology. Johnson et al. (2013) has emphasized that it is not only owners and staff that need to be aware of how e-procurement systems work: customers must also be educated because they influence the procurement method and play a vital role in the diffusion of e-procurement. This lack of skills can also be related to government efforts because the government must help in spreading IT education in the country.

Absence of procurement-specific laws and regulations was another barrier found by this study which is extremely important for the uptake and adoption of e-procurement in Saudi Arabian SMEs. The head of procurement in Ahmed Bamaroof declared it to be one of the biggest hurdles in the adoption of e-procurement in Saudi SMEs:

*“Legal issues are one of the biggest hurdles in the adoption of e-procurement and other e-commerce solutions because the government hasn’t developed any*

*legislative framework for online trading and conflict resolution between the suppliers and buyers.”*

These findings complement the e-procurement literature, in which specific e-procurement legislation is considered very important for the adoption of e-procurement. Teo et al. (2009), Engstrom et al (2009) and Uyarra and Flanagan (2010) all found a lack of e-procurement-specific legislation to be the biggest hurdle in SMEs' adoption of e-procurement in developing countries. Turban et al. (2015) stated that both buyers and suppliers need elimination of fear in contract-related issues, which can only be achieved via a clear and standardised legislation which is in line with international laws, because SMEs will be involved in procurement with suppliers in other parts of the world.

Most of the interview participants mentioned readiness of suppliers in their interview statements and understood that it is one of the key factors that has a vital role in SMEs adoption of e-procurement e.g. the head of Ahmed Bamarooof explained it in the following words

*“If you are relying on supplier from a developed country it will be easy to adopt e-procurement because most of the suppliers will already have e-procurement in place but if you are relying on a local supplier or from another developing country you will need to ask and check if they are ready and willing to make the necessary changes”*

Similarly the head of IT department in Ahmed Bamarooof stated that

*“E-procurement adoption is very much dependent on the willingness and readiness of your preferred list of suppliers for its adoption. If they are not ready or not willing to adopt e-procurement first adoption won't bear much fruit”*

The head of KA also expressed similar feelings. He stated that

*“E-procurement is a very good tool and provides a lot of benefits to the firm but its adoption depends on your supplier. If the preferred list of suppliers have reservations regarding the adoption, the SME can't go ahead with the adoption process which means supplier is a vital external force that affects the adoption of e-procurement in SMEs”*

Other participants from across the four selected SMEs had similar views and believed that suppliers readiness and willingness to adopt and integrate e-procurement in their setup is very vital and affects SMEs adoption of e-procurement.

Sila (2013) confirms that Suppliers' pressure can be another external factor that affects a firm's adoption of e-procurement. Sila (2013) further stated that such pressure is due to the fact that it will improve communication between the two parties, reduce cost and also give rise to operational benefits for both the SME and the supplier, and is thus mutually beneficial. They further investigated in their study that most buyers are not happy with their suppliers, mainly because the service offered is less efficient or it is slow, but still more than 60% are willing to have e-procurement in place because it is more efficient than the manual system. Some firms might be unwilling, but because better and trusted suppliers only allow electronic procurement, they will need to go ahead with it (GlasGutsmiedl, 2015). Sila (2013) also found a positive relationship between suppliers' adoption of new technology and the number of SMEs that are willing to adopt e-procurement.

Another barrier evaluated by the present study is people's lack of trust in electronic transfer of money, which is a pre-requisite for the adoption of e-procurement. People need to be educated and the culture of e-payment needs to prevail in the kingdom in order to eradicate this hurdle. One of the key reasons mentioned by the head of Ahmed Bamarooof is:

*"Honestly speaking, the banking and payment system is still in the development phase and cannot be trusted as yet. Even some banks have their doubts and hence refrain to allow their cards to be used for online payments via web interface"*

Mahmood (2013) has mentioned that people's lack of trust in e-payment is related to the lack of awareness and culture of e-commerce in a country, for which he blames the lack of IT education and government efforts to enhance awareness and education. Government and financial organisations must educate people and should tell them that electronic payment is very safe and secure. However, only when people associated with SMEs are aware of SSL and the other security measures used will they be able to understand the security of online payments.

In case of the last two SMEs i.e. NWWC and IUT it was also found incompatibility with existing IT hardware and software especially ERP system is an issue and it is very obvious that such things can only be found once an organisation tries to implement a new ICT application e.g. E-procurement. Staff from NWWC particularly found it as they tried to implement Oraclepeople soft and that had issues with existing mysql database and other software the SME has previously installed. The head of the company responded to the query as follows

*“Yes, we did experience incompatibility issues when installing the new oraclepeople soft solution with the existing database and erp system and had to upgrade from mySQL to Oracle database and also upgraded the computers to run smoothly and overcome any compatibility issues”*

Many previous studies have identified smooth incompatibility with existing software information system of an organisation a key issue and barrier to e-procurement adoption because the upgrade increases the organisation cost of adoption which is sometime beyond the capacity of an organisation such as the HR, production and planning, control and finance system of an organisation as is mentioned by Subramaniam and shaw (2002). Rajkumar (2001) has also stated that easy integration of e-procurement with existing software of an organisation as well as its supplier is vital because otherwise it increases the cost of both the SME and its supplier. Similarly Lin and Hsieh (2000) have found that incompatibility with existing software and hardware can be a major issue because it not only increases cost but also the way people work in an organisation and thus will be resisted from people in the organisation as well.

It was also found that policies and regulations are required not only to resolve conflict of interests between the stakeholders but also to overcome and punish all sorts of computer crimes. This can be confirmed by the interview statement of the head of IT in KA who stated that

*“Obviously policies and regulations are very vital because e-commerce takes you beyond geographical boundaries and conflict of interest always arises between the stakeholders. Laws must be consistent with international laws otherwise there will always be a conflict of interest.”*

The head of procurement department in KA stated that

*“It is very important to have clear and consistent legislation in the country covering all aspects of e-business and is in line with international legislation and customs so that conflicts can be easily resolved”*

Similarly the head of procurement department in Ahmed Bamaroof stated that Saudi Arabia can make significant advancement in e-procurement and other e-business activities due to better GDP and per capital income of people but only when appropriate policies and regulations are implemented which are consistent with internal laws both in theory and practices. He described it in the following words

*“Just like in normal procurement process, in e-procurement there always instances where there is a conflict of interest between the purchasing firma and the supplier and laws must be set up to overcome these issues. Unlike normal laws these laws are more bound to be consistent internationally because the involving parties are often from different countries”.*

National policies and regulations affect the adoption of e-procurement in both public and private sector SMEs (Gatautis and Vitkauskaite, 2015). Some of the Asian countries, such as Malaysia, the Philippines, China and Korea, have made the reforms needed for the smooth adoption of e-procurement, while other countries, including Saudi Arabia, are behind in this regard. Policy and regulations must provide necessary protection for businesses, partners, suppliers and customers. Rehman et al. (2012) found that there is a positive association between the policy and regulation framework and the SMEs’ adoption of e-procurement.

#### **7.5.4 Critical success factors**

The analysis of qualitative data obtained from four selected Saudi Arabian SMEs revealed that there are eleven critical factors for the adoption of e-procurement. These factors are integration and compatibility with current system, use of prototypes and gradual implementation, support and involvement of top management, involvement of all stakeholders, qualified and skilled IT personnel in the organisation, functionality and viability of the solution, cost benefit analysis of the solution, government support and

legislative cover, technical maturity of the marketplace, user-friendliness of the solution, good monitoring and training and learning.

The first factor mentioned by the majority of interview participants was integration and compatibility with the current system in the organisation. It was revealed that completely changing the existing system will create complications if the current system is incompatible with existing software and hardware. Morgan and Canoboy (2013) defined compatibility as the degree to which a new system is perceived as being consistent with the existing system, workers' past experiences and the future needs of potential adopters. In the present study, the head of Ahmed Bamaroof described the importance of compatibility as follows:

*"We are a Suzuki franchise selling cars mostly in the Riyadh region of Saudi Arabia and would like an e-procurement to be compatible with ERP system backend technology, so that the entry system remains intact".*

The head of the procurement department in Ahmed Bamaroof further explained this as follows:

*"The compatibility of e-procurement with existing software infrastructure such as databases, Windows and other operating systems, along with the running of other software, is very important because changing the whole working pattern is very difficult, costly and time-consuming for the organisation".*

These findings are consistent with the e-procurement literature: for example, Hyde (2011) found that internet-based procurement systems need to be compatible with existing technology to the greatest possible degree and called this the organisation's innovation fit for the system. Similarly, Ranganathan et al. (2011) stated that the system must be compatible with the organisation's existing hierarchical embedded system.

Pudjianto et al. (2011), in their study in Malaysia, found that integration and compatibility of the new system with the existing system is an indication of alignment not only between the two systems but also in the preferred work culture and practices, because if the system is completely overhauled, the whole work practice will change: therefore, compatibility is vital for the successful operation of the organisation. Change et al. (2011), in their study on

technology-centric business operations, and Veit et al. (2011), in their study in the United States, report similar findings. Tsai et al. (2010) found in their study that compatibility is extremely significant for the successful adoption of e-procurement in any sort of organisation. Rahim and As-Sabir (2011) found that compatibility is also a measure of the skills of people in the organisation and whether or not they will be able to run the new system successfully, because if the new system is completely different, there is less chance of people being able to run it and they will require extensive training, which will cost the organisation a lot of money.

The second factor mentioned by the majority of participants in relation to critical success factors for e-procurement adoption was the use of a prototype and gradual implementation: i.e. installing a pilot version and implementing the new system in a stepwise manner in different departments. As mentioned in Chapter 6, the head of Ahmed Bamaroof described the importance of prototyping and gradual implementation for his organisation in the following words:

*“I think it would be very good to see a prototype version of the system with limited functionality installed first to evaluate how it goes with the existing system and people in the organisation and what advantages it will offer to the organisation. It will also play a valuable role in the decision to adopt e-procurement.”*

Similarly, the head KA explained the importance of prototyping and gradual implementation for his organisation as follows:

*“I think any software solution’s importance can only be seen after actually using it. What people say in theory, in adverts and in marketing is sometime half the truth and in reality the system doesn’t offer many functionalities. The compatibility issues can only be unveiled once the system is installed. Sometimes the system is compatible but is very slow and faulty, so until it is fully evaluated and practically tested by the actual worker it, the full version shouldn’t be installed”*

Participants from the other two organisations also thought that this was very important and reduces the risks for organisation.

The analysis of e-procurement literature reveals that prototyping is very important and enhances the chances of e-procurement solution success for the organisation. Holzinger et al. (2011) found that prototyping is very important for the adoption of any software solution because it helps in interpreting functionality and requirements, improves accuracy and eliminates any ambiguity. Similarly, Sun et al. (2012) found that prototyping in e-procurement adoption is important because it provides an overview and insight into the functionality of the system and helps in identifying problems at an early stage. Further, they found that it helps in developing a solution that is fit for purpose and fulfils its functions in the best possible manner. Slavova et al. (2012) stated that prototyping and gradual implementation allow system end users to feel involved, take ownership and appreciate the final solution of the system.

Another critical factor that was found in this qualitative study across selected Saudi Arabian SMEs was the involvement of top management in e-procurement adoption. Interview participants found it very important for the adoption of e-procurement; for example the head of Ahmed Bamaroof said:

*“Actually, top management is mostly the owners, who have a final say in the adoption of any innovation or making any other strategic decision. They must be convinced to invest in e-procurement because it offers a lot of benefits”*

Other participants also made similar comments, which are quoted in Chapter 5. The analysis of these statements reveals that they are consistent with the findings in the e-procurement literature. It was particularly the case in smaller organisation, where the heads were the owners and were making all necessary decisions. The literature on e-procurement puts great emphasis on the importance of top management support for e-procurement adoption. Mose et al. (2013), in a study in Kenyan firms, found that without the support of top management, e-procurement adoption will be a failure. They further stated that attention and support from top management helps in fully understanding the requirements of the organisation and the solution fully fits into those needs. This is particularly relevant in



SMEs, because in most cases the owners are part of the top management, as mentioned by Duan (2012), who found that top management involvement and support guarantees the provision of necessary resources for the adoption of e-procurement: i.e. technical expertise and monetary resources. Ramadani et al. (2009) found that knowledgeable and innovative top management greatly helps in the adoption of e-procurement and management who are less knowledgeable about the importance of innovative technology resist changes. This means that the knowledge and education level of top management plays a vital role in e-procurement adoption.

The analysis of qualitative data in Chapter 5 further reveals that the involvement of stakeholders (customers, employees, suppliers etc.) is important for the adoption of e-procurement and was mentioned by the majority of participants. The role of suppliers was particularly mentioned by most of the participants because they are directly affected, as was mentioned by the head of the procurement department in Ahmed Bamarooof :

*“E-procurement not only affects the organisation and its staff but it equally affects the suppliers and other partners: therefore, involving them in decisions about e-procurement adoption is very important.”*

The e-procurement literature has found a direct relationship between stockholders' involvement and successful adoption of e-procurement (Clark et al., 2012; Davindoson, 2002; Lin and Shoa, 2002). Moe and Paivarinta (2013) have stated that both understanding and involvement of stakeholders is critical for the adoption of e-procurement. They particularly stressed the participation and involvement of suppliers and employees of the organisation. Pand and Sahu (2012) state that stakeholder involvement helps in correctly identifying the requirements of the system and providing relevant information that is necessary for the adoption of e-procurement. In short, stakeholders' involvement is critical because their role greatly influences the implementation process of e-procurement.

Another critical success factor found by the study was the role of skilled and qualified IT personnel in the organisation in the adoption of e-procurement. The study found that this is vital and most interview participants felt that IT skills and knowledge determine the successful adoption of e-procurement. For example, the head of Al-Maram stated that:

*“To be honest, people with adequate IT skills and competencies are extremely vital for the organisation’s adoption of e-procurement. At the moment, we lack such people due to limited resources and that is the reason why I feel we are not ready for the adoption of e-procurement.”*

The literature review reveals that this factor is consistent with other procurement studies in SMEs: for example, Khan et al. (2010) stated that rapid changes in technology require people with experience and up to-date knowledge of IT. Meehan and Bryde (2015) stated that the IT skills and knowledge of people directly involved in using the system determine the successful implementation of e-procurement solutions. Tran et al. (2014) and Aman et al. (2011) have also found that innovative skills and up-to-date knowledge help organisations to operate competently in the wake of e-procurement adoption to gain competitive edge over other organisations (SMEs).

The study also found that the functionality and viability of the e-procurement solution is critical for the adoption of e-procurement in selected Saudi Arabian SMEs. Quite a few people mentioned this in their responses, especially those in top management positions and those in the IT departments. For example, the head of the IT department in KA stated that:

*“In addition to cost, the organisation must be fully aware of the functionalities it requires from the solution and whether or not it will fit into its current technical architecture and the human resources that are available or can be accessed if required.”*

This finding is in line with the e-procurement literature, where this aspect is discussed in depth and is considered critical. Lee and Oh (2008) stated that viability in terms of financial resources and technical expertise is crucial for SMEs due to their limitations. Salo (2007) added that the organisation will not only look at the cost of solutions but also at the technical architecture and skilled people it will need for the solution to be successfully run by the organisation. Mital and Ramesh (2014) and Uyarra (2013) have stated that an SME must be aware of the functionalities of the solution, its cost and whether it will fit into the current system or whether an upgrade will be needed. Ekman et al. (2014) have also expressed similar thoughts, stating that organisations’ requirements and functionality of

procurement solutions must be understood and agreed and the cost must be viable for the organisation. They further added that not only the organisation but also its potential supplier's viability in terms of staff and technical architecture is critical for the adoption of e-procurement.

Another critical factor evaluated by the study was cost-benefit analysis. Interview participants' responses in Chapter 5 show that the potential benefits of e-procurement need to be evaluated against the cost of the solution and the organisation should go ahead with the solution only if there are worthy benefits. The head procurement in Ahmed Bamaroof explained this as follows:

*"We must not jump into e-procurement only because it automates the procurement process or because most SMEs around the world are adopting it. We will be conducting our own cost-benefit analysis, as the solution must be worth adopting. It must fulfil all that we want from it within a cost that we can easily afford".*

The findings from the e-procurement literature seem consistent for SMEs: as mentioned earlier, monetary resources are very important. Angles and Nath (2015) have found that a solid business case must be built to justify the need and importance of e-procurement for the organisation. Hsu and Chen (2015) also understand that cost-benefit analysis is important because it allows an organisation (SME) to justify the functionalities of e-procurement solutions and the cost needed to adopt the solution. Weerakkody et al. (2013) stated that an analysis of all potential costs, such as installation cost, technical architecture, expertise needed, service and support and other hidden costs, needs to be carried out in relation to the benefits and services that the organisation will obtain in order to justify the adoption. They added that sometimes an organisation does not need e-procurement, so it is vital that analysis be conducted either internally or by external experts to justify its adoption.

Another important factor found by this study is the technical maturity of the market-place. Quite a few interview participants argued that the local market needs further maturity in

order to be viable for e-procurement adoption. The head of the procurement department in Ahmed Bamaroof hinted towards this in his interview response:

*“As an SME, you cannot operate in isolation. Operating in a country where the market is not fully mature to adopt e-procurement can be dangerous because as a business you cannot operate in isolation. While the use of innovative technology can offer competitive advantage if local suppliers and partner firms are not ready to adopt e-procurement, the decision can work inversely for the organisation. One must take market maturity into account in making a decision to adopt e-procurement.”*

Khorana et al. (2014) stated that the power of new technology (e.g. e-procurement) is undeniable, but what is also important is the maturity and viability of the market where it operates. They further added that e-procurement adoption is influenced by suppliers, partners and other market forces and thus the maturity of the whole market is vital for its successful adoption. Kaliannan et al. (2009) and Khanapuri et al. (2011) also analysed the market maturity aspect and stated that it positively influences the adoption of e-procurement. From this study and the work of Al-Ghamidi (2012), it can be deduced that the Saudi market has improved greatly in recent years but further maturity is needed for successful adoption of e-procurement in Saudi Arabian SMEs.

User-friendliness of the e-procurement solution was another factor mentioned by quite a few of the interview participants. This is to be expected, because as has been stated previously, there is a lack of qualified IT staff and skilled people in Saudi Arabia, and those with minimum skills will obviously need help facilities and other useful features in the solution, as was mentioned by the head of procurement in KA :

*“I think user-friendliness of the software and the availability of a help facility is very important for the successful adoption of e-procurement.”*

Further, the head of the IT department in KA stated that:

*“In the Saudi Arabian context, it is essential that the e-procurement solution has an efficient help facility, uses common and user-friendly icons, has a full GUI (Graphical user interface) and provides support in both Arabic and English.”*

This is obviously in line with previous studies (such as the works of Isikdag et al, 2011; Eadie et al, 2010; Ronchi et al, 2010; Teo et al, 2009;). Isikdag et al. (2011) stated that user friendliness is a cultural factor and in countries where there is less of a culture of e-procurement, more help and user-friendliness will be needed due to their reduced skills and awareness, while in countries with more highly-skilled people and a culture of e-procurement, less user friendliness will be needed, but it will still be critical. From this, it is obvious why this factor is very important in Saudi Arabia. Similarly, Brun et al. (2010) found that a higher level of user friendliness is positively related to the adoption of e-procurement. Gunasekaran and Ngai (2009) also found this to be a very important and critical factor for e-procurement adoption.

Last but not least, the present study also found that a good monitoring, training and learning process in the organisation is critical for the adoption of e-procurement. As is evident from the above discussion, there are fewer IT-skilled people in Saudi Arabia and organisations will thus need to arrange their own training and learning programs to enhance the skills of their personnel and make them ready for the adoption of e-procurement solution. The study also found that people’s weaknesses can only be found if a mentor or skilled individual closely monitors their working and coaches them on these weaknesses and deficiencies. This was described by the head of KA’s IT department as follows:

*“Training and learning lay down the foundation for a supportive environment where people are not only provided with new skills but also their problems can be addressed in time and in a nice user-friendly manner.”*

Similarly the head of IT in Ahmed Bamaroof (HITC1) stated that:

*“The adoption of e-procurement will be like a quantum jump for the organisation so it will be extremely important that all stakeholders (employees, customers,*

*suppliers and partners) are properly facilitated to digest the technology (e-procurement). The smooth adoption of e-procurement by people who are accustomed to manual procurement to a greater extent will depend on the type and amount of training imparted to them.”*

This is also supported by the e-procurement literature. Rahim (2008) stated that training allows employees to overcome difficulties in using complex IT applications introduced in an organisation. Similarly, Halim et al. (2013) and Nurmandi (2013) found that training is vital for the transfer and knowledge and skills between employees in the organisation and improvement in work. Rahim (2008) further emphasised the importance of help in the acceptance of new, innovative and complex technology, of which e-procurement is an example. Hence, one can deduce that training and learning within the organisation, coupled with monitoring, is vital for the adoption of e-procurement.

#### **7.5.5 Future organisational performance**

The analysis of qualitative data obtained in relation to perceived future organisational performance in Chapter 5 reveals eight important factors, namely improved communication with customers and suppliers, reduction in purchasing time and cost, increased competitiveness, increased transparency and accountability, strategic alliance and networking, short-term organisational performance, long-term organisational performance and knowledge management and data warehousing.

The first factor mentioned by the majority of the interview participants was improvement in communication with customers and suppliers. Thus is described in detail by the head of Ahmed Bamaroof as follows:

*“E-procurement will improve business-wide communication, i.e. communication with suppliers, customers and other stakeholders. Any changes in orders can be quickly communicated and thus its impact on business and its customers can be eradicated or at least minimised. Customer satisfaction and loyalty will increase and also trust in suppliers will be strengthened as a result of efficient communication and the business will flourish.”*

This factor is widely discussed in the e-procurement literature and studies by Atkinson (2001), Sadowski et al. (2002), Lancioni et al. (2003) and Lankford (2004) and Chen and Duan (2002) have all found that e-procurement adoption leads to improved communication with customers and suppliers. Cheraghi et al. (2011), in their recent study, found that e-procurement plays a vital role in knowledge sharing and communication with suppliers. Beheshti et al. (2007) found improved communication with vendors and customers to be a highly motivating factor for firms' future performance related to the adoption of e-procurement. Croom and Brandon-Jones (2007) found that 60% of respondents related the adoption of e-procurement to improvements in communication with customers, which was the third highest factor in their study with a usage rate of 2.72.

Reduction in overall purchasing time and cost was another motivating factor which the interview participants attributed to the future organisational performance of Saudi Arabian SMEs. For example, the head of Ahmed Bamaroof described this factor as follows:

*"E-procurement will allow SMEs to select the best supplier not only on the basis of lower product price but also on the basis of product quality, method of delivery and delivery time. Delivery time is critical because it can help in reducing the whole procurement cycle and leads to operational efficiency."*

Previous studies in e-procurement by Atkinson (2001), Lancioni et al. (2003), Yu et al. (2008) and Engstrom et al. (2009) affirm and complement the importance of this factor, its relationship with e-procurement and its impact on the future performance of the organisation. Ronchi et al. (2010) found that companies like Nestle, Motorola, Schlumberger and Renault have substantially reduced the cost and time of transactions through e-procurement implementation. Similarly, Dooley et al. (2009) found that e-procurement implementation reduces the number of staff, transaction cost, inventory level and procurement cycle, thereby reducing the overall cost to the organisation.

Another factor found by the study analysis and mentioned by most of the participants was related to an increase in organisations' competitiveness. The head of procurement in Ahmed Bamaroof was quoted as saying:

*“E-procurement will allow us to choose from a wider pool of suppliers and also from a wider pool of products: thus the material quality will be improved, which will help in building existing customers’ trust and attracting more customers to keep business competent.”*

Studies by White and Daniel (2004), Driedonks et al. (2005) and Yu (2008) confirm this statement. Gamal (2010) has found that e-procurement minimizes human error, improves staff utilisation, reduces the procurement cycle, improves contract compliance and thus results in overall competitiveness of the organisation. Quesada et al. (2010) found that e-procurement adoption leads to reduction in processing time and cost incurred and increases revenue through better customer service and satisfaction, resulting in a more competent firm. Yu (2009) also found that e-procurement adoption leads to transaction efficiency and expansion in firms’ trading, and thus gives them a competitive edge over other firms that have not adopted e-procurement. He further stated that firms can better address customer queries and process and deliver their orders in time.

The analysis of interview data from participants from selected Saudi Arabian SMEs also revealed that e-procurement leads to strategic alliance and networking: i.e. bringing firms and suppliers together into a network where both become strategically important for each other’s success. For example, the head of procurement in Ahmed Bamarooof stated that:

*“E-procurement can be very beneficial in future because it can reduce the overall cost and brings enterprises closer together by binding them electronically into a strategic alliance, which leads to stronger cooperation and success”.*

The importance of this factor for organisational future performance and its relevance to e-procurement adoption is confirmed by Knudsen (2003), Ritter et al. (2004), Kar (2009) and Walker et al. (2013). Kar (2009) found that transparency and accountability in the supply chain as a result of the adoption of e-procurement leads to new strategic relationships wherein the buyer and supplier depend on each other for their success. Walker et al. (2013) extended this further, stating that e-procurement leads to greater information and knowledge availability about different suppliers and buyers, which is of benefit to everyone



in the network and not just to a specific firm: thus, a wider strategic network is created in the industry.

With regard to the short-term benefits of e-procurement responses varied: some respondents were of the opinion that e-procurement leads to short-term improvements in performance, while others believed this not to be the case. For example, the head of Ahmed Bamaroof stated his opinion regarding short-term benefits as follows:

*“The organisation can get short-term benefits from e-procurement, as it has a better infrastructure and the suppliers are external firms (outside Saudi) who already have e-procurement systems, and local customers are getting used to electronic technology too.”*

Meanwhile, the head of Al-Maram stated that

*“I do not see any short-term performance improvement for my firm from e-procurement adoption.”*

One possible reason for the discrepancy between these two responses could be the difference in the size of the organisations and their human and technical resources and business scope, because Al-Maram is a small organisation with limited resources compared to Ahmed Bamaroof. Some researchers understand that short-term benefits can be gained via e-procurement implementation: for example, Kumar and Maher(2008) state that reductions in transactional cost and the time of the purchasing cycle are short-term benefits that an organisation can gain from e-procurement adoption. Similarly, Vaidyanathan and Devaraj (2008) and Teo et al. (2009) both understand that the benefits of e-procurement can be realised straight away after the adoption, while Wu et al. (2007) state that better coordination with stockholders, greater flexibility and reduced transaction time are instant short-term benefits that organisations can get from e-procurement adoption.

Unlike short-term benefits, however, the majority of the participants agreed that there is a positive relationship between e-procurement adoption and long-term benefits. This is evident from the participants' interview statements: for example, the head of Ahmed Bamaroof stated that:

*“The use of technology is on the increase on the firm as well as individual level and I can foresee a lot of benefits for the firm in the long term. I believe that firms adopting it early will get more benefits than those who will catch up later.”*

Similarly, the head of procurement department in KA stated that:

*“In future we would like to extend our self to other cities and towns and I have firm belief that e-procurement adoption will have a positive role to play in our mission.”*

Kim et al. (2015) state that e-procurement leads to long-term benefits for the organisations, citing the examples of Philips, the Swiss Air group, HP and CISCO, where on average financial savings of 8% to 15% were made in twelve-month projects. Similarly, Devraj et al. (2012) also found that e-procurement leads to huge benefits in the long term.

Another very important factor in relation to future performance is knowledge management and data warehousing, which was mentioned by many respondents in their interview responses. For example, the head of Ahmed Bamarooof stated the following:

*“E-procurement is an effective tool that allows us to have better knowledge management and data warehousing, which helps greatly in choosing a supplier with the best material and low cost.”*

Wu et al. (2007) state that knowledge management and data warehousing is a valuable performance factor because with better knowledge of the past and present, an organisation can adjust itself and perform better in the future. Rahim (2008) also understands that better knowledge management and data warehousing is extremely important for future performance of organisations and can be achieved from e-procurement adoption.

### 7.5.6 Culture factors to e-procurement adoption in Saudi SMEs

From the interview responses, it was also evident that prevailing organisation culture impacts the adoption of new technology such as e-procurement. Most respondents believed that an analysis of the social factors and cultural characteristics of the organisation is important because e-procurement and other innovative technologies require a specific working culture and behavioural characteristics. For example; the head of Ahmed Bamaroof mentioned the positive impact of e-procurement on the prevailing organisational culture as follows:

*“Actually e-procurement allows you to get access to markets and suppliers across the country to various geographical locations with innovative products. Also it allows staff to communicate with people and understand how they communicate and work. Similarly everything is very transparent and staff can be held accountable for the products they buy and suppliers they choose.”*

This is consistent with the findings of Bertot (2010) and Walczuch et al. (2007), who have stated that transparency and eradication of corrupt practices is an important social and cultural norm of Saudi Arabia governed by the law of Sharia, which emphasises justice and eradicates corrupt practices.

The head of Al-Maram stated that:

*“Most of this innovative technology such as e-procurement is tailored for western SMEs and thus its adoption will bring some of those characteristics to Saudi Arabian SMEs, which will be beneficial for our future business expansion”*

According to Internet-live-stats (2014), the realisation of e-commerce and e-procurement benefits is related to the cultural traits of the country. It further reveals that penetration of the internet and related technologies worldwide is 40%, while in majority of the western countries it is more than 80% (Meeker, 2014). This is because innovative technologies were developed in the west, where the culture is different from those of the emerging markets such as Saudi Arabia (Straub et al., 2009; Van Slyke et al., 2010).

Also the head of Ahmed Bamaroof’s IT department stated that:

*“The effectiveness of new technology within an organisation is impacted by its prevailing culture or vice versa the organisation culture is impacted by new technology. Therefore it is vital that management and staff are willing to welcome such change.”*

This can be confirmed by many studies on the relationship between culture and the adoption of innovative technology. For example Straub et al. (2002), stated that the efficiency and effectiveness of an ICT's deployment in an organisation is affected by its cultural, social and behavioural characteristics: therefore, a clear understanding of those factors is vital and helps in deciding whether an organisation is socially and culturally ready for the diffusion of new technology (e.g. e-procurement). Im et al. (2011) and Cheung et al. (2013) have stated that culture is a very important factor in understanding and explaining the social, cultural and behavioural interactions of people in the organisation with new innovative technology.

The head of Al-Amazon also believed that culture has a vital impact on the current status and readiness of an organisation for the adoption of e-procurement:

*“To be honest, diffusion of innovative technology requires a specific favourable culture which is open to changes. Saudi Arabian culture is very positive in this regard and welcomes such changes, but only if they are sure about the benefits and it is not against the core values and norms of the society.”*

Al-Kinani(2010) has evaluated various aspects of culture in the Arab world in relation to e-commerce adoption and has found some specific factors that are necessary for the cultural e-readiness of e-commerce adoption, including e-procurement, which is an aspect of e-commerce. Alkinani (2010) found that the language used in business, government support in developing ICT cultures, the language used in personal daily communication, the culture's openness to foreign influence, employees' cultural impact on work and the consistency of technology are cultural pre-requisites for the adoption of innovative technology. According to Straub et al. (2009) and Zureik(2014), finances have never been a problem in the oil-rich kingdom of Saudi Arabia: it is the cultural values and beliefs that have played a key role in the current state of technology adoption.

Thus the study findings of cultural impact on organisations' e-readiness for e-procurement adoption is consistent and in line with the literature.

Most of the interview respondents understood that understanding the prevailing culture of the organisation is critical for the adoption of e-procurement and affirmed that it has a great impact on the adoption of any innovative technology such as e-procurement. For example, the head of KA stated that:

*"It is very obvious that cultural characteristics of an organisation impact any sort of innovative technology adoption in the organisation. People in the organisation find it hard to change the way they have been working over a long period of time and thus show great resistance to change."*

Similarly, the head of Al-Amazon understands that:

*"Organisation with innovative culture, having already adopted some innovations and having skilled people, find e-procurement adoption easy, while those with less experience and using traditional ways of business find it difficult"*

These statements support previous findings by authors such as Jayawardhena(2004), who, in his value-attitude-behaviour model, found that individuals' attitude towards the use of e-business technologies such as e-procurement can be directly predicted by their planned behaviour. A relatively new study conducted in e-learning by Haag et al. (2009) revealed that personal values and behaviour influence PKD ("Personal Knowledge Development"). Calisir et al. (2014) further stated that personal values vary in the context of specific situations and environments.

Most of the respondents indicated that cultural characteristics such as language, religion, prevailing working norms, traditions and experiences greatly impact the adoption of e-procurement. For example, the head of KA stated that:

*“Unless there is greater awareness, training and education for technology management, employees’ and suppliers’ behaviour will be a bigger cultural challenge for the adoption of e-procurement”*

This is consistent with the findings of Iqbal (2011), who believes that SMEs’ owners in the Arab world lack skills and are unable to use these technologies, and thus show resistance towards adopting them.

The head of Al-Amazon also understands that:

*“It is very hard for people to accept alterations to their work pattern and in this case there is job insecurity for those with fewer technical skills.”*

Unlike Iqbal (2011), Mathew (2010), has stated that the main barriers to the adoption of e-procurement are cultural implications and not technical issues. Some of these non-technical barriers, according to Johnson (2010), are religion, language, background, experiences and expectations from e-procurement. Khalfan and Alshawaf (2004) have found that there are some cultural, managerial and environmental barriers to the adoption of innovative technology, such as language, privacy, security issues and people’s preference for using traditional means of communication.

On the relationship of current business working culture and flexibility and organisational future performance, the head of the IT department in Ahmed Bamarooft stated that:

*“To be honest, there is a strong link between the organisation’s culture and its future performance as a result of e-procurement adoption. An organisation with a flexible culture which encourages empowerment and knowledge management is expected to gain more than one with a conservative culture”*

Similar, the head of Al-Amazon stated that:

*“An organisation with greater employee empowerment, knowledge management techniques and open to taking risks and challenges is expected to gain more and perform better in the wake of e-procurement adoption”*

As discussed by Al-Kinani(2010), acceptance of innovative technology is in line with the national culture of Saudi Arabia; however, future performance, according to Cheng et al. (2004), depends on the empowerment of employees. However, as examined by Al-Shehri (2010), Saudi SMEs' owners have a rather dictatorial approach and make all the decisions themselves. Therefore, it is necessary to discourage this approach through training and innovation to obtain maximum performance from the adoption of e-procurement in the Saudi Arabian SMEs.

Another important element that is perceived to affect the adoption of e-procurement is the business culture and environment of a country. Many study participants mentioned it in their interviews and understood that it has a vital impact on the SMEs adoptions of e-procurement. This can be confirmed by the interview statement of the head of KA who stated that

*“Business culture of a country which includes consumer preferences, business culture, industry structure and other demographics elements constitute a very important element that will have affects on the adoption of e-procurement Saudi Arabian SMEs”.*

The head of procurement department in KA also had similar views and believed that it is a key external factor that acts as an important inhibitor or enabler for e-procurement adoption Saudi Arabian SMEs. He expressed his views further as follows

*“I think one of the most important factors that can have an impact on the adoption of e-procurement is the business and National culture of the country”*

He further added that

*“Saudi National and business culture have features that will act as inhibitor of e-procurement adoption such as culture but there are other features such as GDP, per capital income and the presence of MNCs that can have positive impact on the adoption of e-procurement in the Kingdom”*

Another very important point mentioned by the head of IT department in Ahmed Bamaroof regarding National environment and demographics of Saudi was regarding the population living in Cities which he thought is a good enabler of ICT. He expressed his views as follows

*“Majority of Saudi people live in cities (approx 85%) which is good because it is easy for the government to lay IT infrastructure in Cities needed for e-procurement and other e-business activities”*

Change takes place quickly in an unstable and turbulent environment but at a very slow pace in a stable business environment (Lynch et al., 2012). However, in the modern business world, SMEs must be innovative get competitive edge over others in the industry. For quality customer services, firms need innovative products, managerial efficiency and fast information processing, which call for innovative IT technology, including e-procurement. Firms doing business in a competitive and unstable business environment need reduced transactional cost via supply chain integration and e-procurement adoption (Vecchiato, 2012).

Previous studies have found that firms in a hostile environment are more likely to adopt e-procurement (Vohra et al., 2015).

#### **7.5.7 Perceived External Factors to e-procurement adoption in Saudi SMEs**

Analysis of qualitative data in chapter 5 revealed that there are quite a few external factors that has a great impact on adoption of e-procurement in Saudi Arabian SMEs, which lead us to the extension of GN(2009) model to incorporate external factors as shown in figure.

Government support was found to be the first and one of the most important factors for the adoption of e-procurement as stated by majority of the interview participants. They mentioned various different ways such as the improvement of infrastructure, laws and regulations, intellectual property protection, financial support, education programme and promotion of ICT usage etc in their interview statements that are related to the government and positively influence SMEs adoption of e-procurement. This can be confirmed from the interview statement of the head of Suzuki who stated that



*“Government has a very vital role in SMEs adoption of e-procurement in Saudi Arabia. It has role in improving ICT and communication infrastructure (e.g. Broadband and mobile communication), making and improving new e-commerce and procurement laws, incorporating ICT syllabus in school and colleges”*

The head of IT in Ahmed Bamarooof also believed that Government is a key external factor that can have positive or negative impact on SMEs adoption of e-procurement. He therefore stated as follows

*“The role of Government is very vital because SMEs often have limited finances and can't afford expensive ICT tools as well as experts so rely much on government to provide financial support and insure the availability of cheaper IT experts in the market to insure smooth adoption of e-procurement by firms”*

He further stated that

*“The Government need to provide a regulatory framework that is consistent with other countries of the world because E-procurement extends SMEs beyond geographical locations”*

The role of government in e-procurement adoption has been discussed extensively in literature.(Chan et al., 2012) has confirmed this in their study stating that ,It is very common across the business world to look for government support, and the same is the case for Saudi Arabian SMEs. One main reason for government support is that it enhances people's trust in online business and they feel more secure (Chen and McQueen, 2008).

Majority of the interview participants accepted that the country has made advancements in field of mobile and broadband connections but they still believe that the speed and cost need to be further reduced for firms to adopt e-procurement on a broader scale. It can be confirmed by the interview statement of the head of Ahmed Bamarooof who stated that

*“Although the availability of internet has increased in the countries yet speed and price is a problem. Even availability is an issue in some rural areas of the country although not many people leave in rural areas but in order to make it a success high speed and low cost internet should be available across the country”*

The head of IT department in Ahmed Bamarooof stated that

*“Many SMEs in developing countries fails to adopt e-procurement due to the cost and availability of internet connection in those countries”*

A high speed connection is required so that the SME’s e-procurement system can be integrated into the supplier’s system. Compatibility with the supplier’s network is very important if the SME wants to get the full benefit of automatic transactions (RajKumar, 2001; Croom and Brandon-Jones, 2004). Croom and Brandon-Jones (2004) found a strong relationship between the performance of e-procurement systems and network speed or connectivity.

The head of IT department in KA also uttered similar words in his interview statement. He stated that

*“E-procurement is hampered by high cost and lower availability of internet connection in developing countries and the case is not much different in Saudi Arabia. Although the availability has increased and price has reduced in the last five years or so but I believe further improvement is needed in terms of cost reduction and increase in speed”*

The head KA stated that

*“E-procurement require IT skilled people in the country, you can’t rely on expatriate because firstly it is very costly. The local human workforce must develop in order to make e-procurement adoption easy. At the moment skilled IT workforce is not enough to meet to take up the positions”*

The head of IT in Ahmed Bamarooof stated that

*“It is a reality that the there is not enough IT skilled people in the country. The situation might will change in a few years time because the government and ministry of IT and communication is investing heavily to prepare a local IT skilled workforce”*

He further stated that

*“Apart from the availability of IT skilled people it is also very vital that the owners of these SMEs are trained and imparted awareness on the efficiency of E-procurement and other ICT applications for their business in the long run. This where I would say the role of the government is very important”.*

Another very important factors that was mentioned by the study participants was competitor's pressure which they thought is very important in current global digital era because customer looks for the best quality and cheaper price products and keeping them loyal to a firm is very difficult. Since e-procurement allow firms to get connected with global suppliers and get the cheapest deal and in time, allow firms to sell in time and cheaper prices to its customers. The head of Ahmed Bamarouf expressed his views of competitors pressure as follows

*“Competitor's pressure in the era of globalisation is a very important external factor that forces firm to adopt innovation (e.g. E-procurement etc). E-procurement is a good mean of reducing prices and getting competitive advantage. However firms lagging behind in adopting innovation will find it hard to survive because they are now facing competition from local as well as international firms in the era of globalisation”.*

The head of procurement department in Ahmed Bamarouf stated his views regarding competitive pressure as follows

*“Competitive pressure is a key external factor which pushes SMEs to adopt innovation like e-procurement. It allows firms to extend its supplier options and have a better bargaining power to reduce prices. Similarly it also allows firms to extend its consumers base and ultimately can generate more money”*

This is in line with the findings of Tsai (2012) who stated that competitor's adoption of e-procurement directly forces firms to adopt it another to remain competitive. Sila (2013) has further extended that e-procurement allow firms to get the cheapest deal and can thus sell it in cheaper prices than its competitors thereby attracting more customers.

### 7.5.8 Summary of qualitative findings

Analysis of qualitative data revealed that ICT acceptance is dependent upon the socio-cultural needs of a country and its firms. It can therefore be deduced that the slow penetration of ICT in Saudi Arabia and other parts of the developing world can be attributed to the cultural readiness of these countries and their firms for the adoption of e-procurement and other ICT tools. It was also found that there are many external factors that can positively motivate or otherwise can exert pressure on an organisation to adopt e-procurement in addition to many internal factors. External factors of e-procurement are wider in scope and cover social, political and other infrastructural factors that will positively impact a firm's adoption of e-procurement.

Similarly the qualitative data revealed an additional factor "current e-procurement activities" which the participant though is related to the future adoption of e-procurement that wasn't mentioned by Gunasekaran and Ngai(2009). Further it was also found that not only the number of qualified staff within the SMEs are important for the adoption of e-procurement but also the availability of qualified staff (human resource) are related to the adoption of e-procurement.

In addition to confirming Gunasekran and Ngai(2009) benefits factors the study additionally found that that e-procurement adoption leads to "increased transparency" which wasn't mentioned by them.

In terms of e-procurement barrier the lack of Government support and weaker infrastructure was more pronounced as was the lack of skilled people unlike GN(2009) where these were moderate barriers. Similarly the two SMEs who had already embraced e-procurement revealed that incompatibility with existing softwares and hardwares of the SMEs is also a barrier because most SMEs run outdated software and the upgrade can be quite costly for these SMEs.

In terms of perceived future organisational performance the findings were in line with e-procurement literature, however four additional factors were found by the study i.e. "Increased transparency and accountability", "Strategic Alliance and networking", "Knowledge Management and Data warehousing".

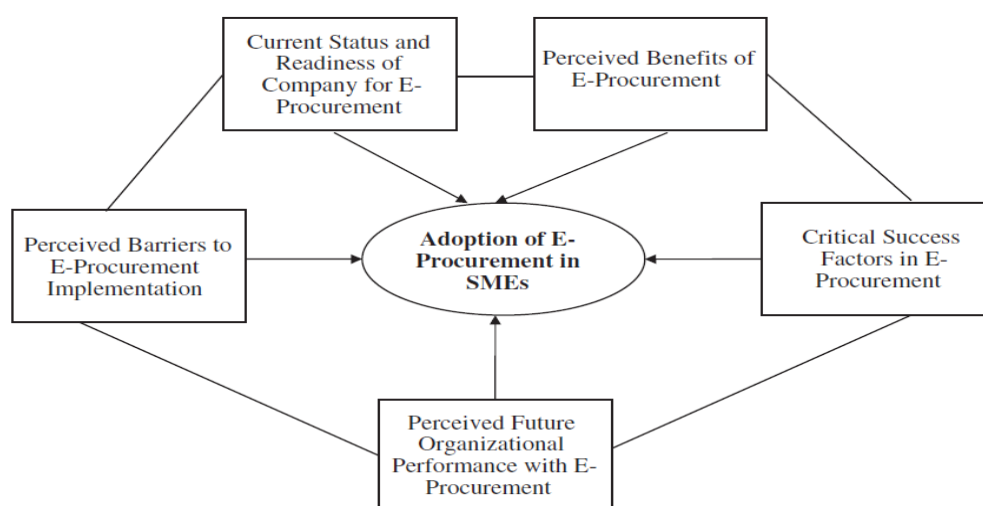
In terms of critical factors “Absence e-procurement specific laws and regulations” and “Lack of trust in electronic transfer of funds” were two additional factors in Saudi Arabian SMEs.

In terms of perceived future organisational performance the findings were in line with e-procurement literature, however four additional factors were found by the study i.e. “Increased transparency and accountability”, “Strategic Alliance and networking”, “Knowledge Management and Data warehousing”.

## 7.6 Extending the Gunasekaran and Ngai (2009) model

### 7.6.1 The original GN (2009) model

The author adopted the GN (2009) model as a theoretical framework to get an insight into the current status, barriers, perceived benefits, critical success factors and future organisational performance of selected Saudi Arabia SMEs. Through study of various research models for the adoption of innovative e-commerce and e-procurement technology the author found this model suitable because it extends TOE model to include critical success and future organisational performance factors and also compliments TAM and TPB model by including the perceived risk, trust and other behavioural elements as well as DOI model by including the knowledge, skills and ease of use elements. The GN model has been successfully for research into the adoption of e-procurement in Hong Kong in 2008 and later at south east coast of USA in 2009. Similarly recent studies by Abid et al (2011), Ongori and Migiro(2010) and Eei et al (2012) have highlighted various aspects of e-procurement adoption that are largely focused on current status to know where the current position of the organisation in relation to e-procurement adoption and barriers, benefits, critical success factors for the organisation's adoption of e-procurement and future organisational performance if e-procurement is adopted which are depicted in this model.



### **7.6.2 Introduction to New element of the Model**

The literature on e-procurement and innovative technology shows that culture is relevant to and affects the adoption of e-procurement. For example, GamalAboelmaged (2010) has stated that the adoption of any innovative technology, including e-procurement, is a result of a number of individual decisions. Values and attitudes intervene and mediate the needs from daily life experiences and technology is used to fulfil those needs (Belanche et al., 2012). Innovations are based on ideas, and it is the people who carry, react, develop and modify those ideas (Yousafzai et al., 2007). The attitude and values of an individual and the response expected from a wider group play a key role in the process of diffusion of innovation. It is very natural that individual and team needs will vary, as will the overall behaviour of an organisation in any specific national culture. Nevertheless, people who work and live in a particular cultural environment develop certain norms, attitude, values and practices which are the shared source of interaction and socialisation in an organisational setup and have an impact on the adoption of technology.

The analysis of interview statements (Appendix G) revealed that culture affects the adoption of e-procurement in selected Saudi Arabian SMEs. Further, in response to the question about whether any additional elements affect e-procurement adoption apart from Gunasekaran and Ngai's (2009) five elements, many respondents (22 out of 31: i.e. 70%) stated that there are several external factors that affect the adoption of e-procurement in Saudi Arabian SMEs.

Similarly, the National Federation of Independent Businesses (NFIB), in its 2005 report, suggested that there are many external factors that encourage or discourage an organisation's adoption of ICT innovations such as e-procurement (Nguyen et al., 2015). Andries et al. (2006) and DiGrande et al. (2013) have stated that external factors are forces in an organisation's external environment such as business expansion or improved efficiency. Rogers (2003) stated that external factors are the factors that force managers to adopt ICT innovations to make quick and efficient decisions for the growth and survival of business. Innovative decision-making can be a very good motivator for SMEs because of their poor financial position (Lema and Durendez, 2007). Since these SMEs often have limited financial resources, they need to be highly convinced or motivated to indulge in the

adoption of ICT-related innovations such as e-procurement (Fuller-love, 2006). He further stated that since most of these SMEs mortgage their possessions or property in order to get such innovations into place, they often require real motivation or concrete benefits to do so. They will be either forced or motivated into the adoption by being shown that there are enough potential future advantages to do so. The vision and belief of top management play an extremely important role in making such decisions (DiGrande et al., 2013). Cragg and Mills (2011) and Nguyen (2009) understand that external factors can be viewed as catalysts, pre-requisites, reasons or triggers for the adoption of e-procurement in SMEs or other type of business.

This research intends to extend the Gunasekaran and Ngai (2009) model by adding the elements of culture and external factors in addition to the five factors already established. Since e-procurement and other innovative technologies are mostly developed in the western world, their penetration is higher in those countries, as discussed by Straub et al. (2009) and Van Slyke et al. (2010). Internetlivestats (2014) confirms this by stating that innovative technology penetration is over 80% in the western world as opposed to 40% on average elsewhere in the world. From Johnson (2010), it can be deduced that overcoming this cultural inertia is highly important for the adoption of e-procurement in Saudi Arabian SMEs. Josanov (2008) highlighted some of the key cultural traits that lead to this cultural inertia. He stated that trust, security, changes in work pattern, language, experiences and religion are some of the characteristics of the country that create this cultural inertia and have impact on the adoption of e-procurement in Saudi Arabian SMEs. Therefore, it is essential to take cultural characteristics into consideration while adopting e-procurement in Saudi Arabian SMEs. Culture will have an impact on each of the elements in Gunasekaran and Ngai's (2009) model; however, it is more pronounced as an external factor because the technology itself is a western product that will affect the work patterns of people in Saudi Arabia.



### **7.6.3 The cultural context of the adoption of e-procurement in Saudi Arabian SMEs**

The literature review also leads us to investigate the cultural impact of e-procurement adoption in Saudi Arabian SMEs. From the analysis of qualitative data (chapter 7), it is evident that culture affects all aspects of ICT adoption. The findings confirm the results reported by Betroth et al. (2010), who determined that ICT acceptance is dependent upon the socio-cultural needs of a country and its firms. In line with Straub et al. (2009) and Schepers and Wetzels (2007), it can be deduced that the slow penetration of ICT in Saudi Arabia and other parts of the developing world can be attributed to the cultural readiness of these countries and their firms for the adoption of e-procurement and other ICT tools. The study further found that since these ICT tools are mostly developed and designed in the western world, their features and functionalities are new to the Arab world and are sometimes contrary to its work ethos, values and prevailing tradition in the firm and society. Again, this is in line with the findings of Vance et al. (2008), who found that Arabs traditionally prefer face-to-face communication and business discussion as opposed to the use of technology. Further, from the perspective of Hofstede's cultural dimensions, Saudi Arabia is a country with high uncertainty avoidance, which is another reason why ICT adoption is slow in these firms (retrieved online at: <http://geert-hofstede.com/saudi-arabia.html>, 2015). The present analysis, however, indicates that this perception of doubts about technology for business and communication is gradually changing with increases in education and general awareness by the government in the past few years. CITC and the Ministry of Commerce in Saudi Arabia have taken key initiatives in this regard, which have improved perceptions and affirmed the view expressed by Kirkup (2007), who believes that ICT can penetrate across all cultures provided that the government, infrastructure, human resources and awareness are present in the country and its masses. The study has also found that language is another important cultural aspect that impacts the adoption of e-procurement and other ICT applications. Arabs prefer to communicate in their native Arabic language, while ICT applications mostly require English. The study has also found that Arab culture is not too open to foreign traditions and cultural influences due to strict Sharia laws and other social and cultural implications, while any alterations to social and business life are resisted by common people, in line with the findings of Al-Kinani (2010). The study also

found that Arabic is the prevailing business language in SMEs. The case is no different in other businesses: Al-Kinani (2010) found that 60% of public and 40% of private sector businesses use Arabic for all sorts of business communications, while e-procurement applications are mostly in English, and the language barrier will thus come to the fore. However, as with the other cultural aspects, the study found that the new Arab generation are interested in learning English and adopting it in their business communication. Similarly, the Saudi government is sending people abroad on scholarships for higher education. Even within the country, there is an emphasis on learning technology and English, and the situation is changing, particularly in the last few years. Many people cited lack of a technology-feasible culture as a hurdle in the adoption of technology; however, from Al-Kinani (2010), it can be deduced that this depends on the individual business venture and its top management, and if they are willing, this effect can be minimised.

The study also found that SMEs' culture is improving and people's perception of technology is altering with the establishment of foreign ventures in the country and better electronic media and technological education. Many people foresee further success with the adoption of technology. Traditionally, Saudi Arabian SMEs have mostly been run by their owners in a dictatorial manner; however, in recent times, employees' empowerment and participation has improved, which, as discussed by Kwun (2006), is key to developing a culture that is more feasible and fruitful for the adoption of technology.

In short, Saudi Arabian national and organisational culture has a mixture of features; the adoption of technology in Saudi firms has improved in recent times and the cultural inertia has declined with improvements in infrastructure, education and individuals' awareness.

#### **7.6.4 Perceived external factors for the adoption of e-procurement in Saudi Arabian SMEs**

The Gunasekaran and Ngai (2009) model has mostly concentrated on internal factors, but as is evident from Nguyen et al. (2015), there are many external factors that can positively motivate or otherwise can exert pressure on an organisation to adopt e-procurement in addition to many internal factors. This is particularly important for Saudi Arabia, whose culture is not highly supportive of technological innovation (Brdesee, 2013). It is also evident from Bruque and Moyano (2007) and Tran et al. (2014) that competitors' pressure is a key external force for e-procurement adoption. Chan et al. (2012) argue that there are some other factors that have a positive impact on the adoption of technological innovation in business. These external factors will make the prediction of e-procurement adoption easier for the research in selected Saudi Arabian SMEs. External factors of e-procurement are wider in scope and cover social, political and other infrastructural factors that will positively impact a firm's adoption of e-procurement.

From Brdesee (2013) and li et al (2015), it can be argued that an effective e-procurement adoption requires an environment that is conducive for online buying and selling of goods and also must hail innovation and technology. There are many external factors that can enhance the growth and adoption of e-procurement in the country. At the current point in time, many SMEs and larger companies are reluctant to adopt e-procurement for a range of reasons and challenges that have been highlighted in the earlier discussion of barriers. Suppliers also face numerous challenges and issues, which prevent them from engaging in online procurement of goods. A positive online buying environment can be provided by resolving the inhibitors and emphasising the enabling factors so that a positive business climate can be created (Ghobakhloo et al., 2012). The present study investigates some of the external factors that affect customers and suppliers to facilitate smooth adoption e-procurement in Saudi Arabian SMEs. The research focuses on seven key external factors that can positively impact the adoption and growth of e-procurement in Saudi Arabian SMEs. These factors are trusted and secure online payment mechanisms, government support, low cost and high speed Internet connections and educational programs, competitive prices, having one's own unique postal address and establishing security and trust in an online system that complements physical stores.

The study has identified the general external factors of e-procurement from the works of Forrester (2001-2003) and Minahan and Degan (2001) in the USA, Hawkin et al. (2004) in Australia, Westcott and Mayer (2002) in the UK and Eadie et al. (2007) in Northern Ireland. The validity of external factors was tested via interview questions. Responses to these questions are explained in detail in section 7.3.6.

### 7.6.5 The Proposed Extended Model

The proposed extended model incorporates perceived cultural and perceived external factors found by the study along with new elements found for each of the factors.

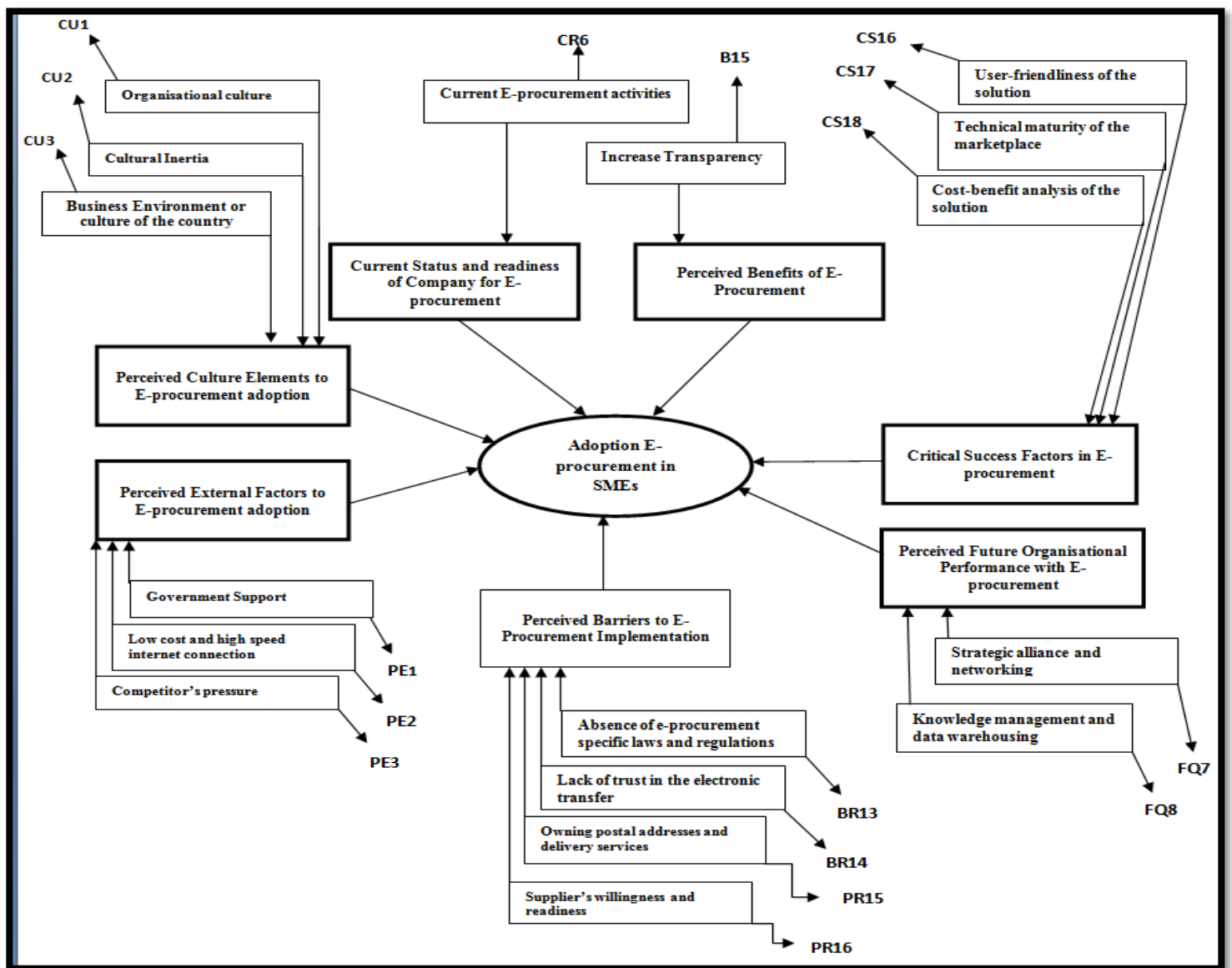


Figure 7.1: Extended Gunasekaran and Ngai (2009) Model

#### **7.6.6 Saudi Arabian SMEs' perspective on the Gunasekaran and Ngai (2009) model elements**

This section demonstrates and explains the study findings based on interview (Appendix G) results obtained from a selected sample of SMEs and justifies them with previous studies and broader literature findings. The section starts by examining perceived cultural and external elements and their proposed dimensions (elements) established by the study findings, followed by new elements found by the study for each of the five GN (2009) model elements, and also demonstrate the elements in the form of diagrams.

### 7.6.6.1 Perceived cultural factors in E-procurement adoption in Saudi Arabian SMEs

Analysis of qualitative data obtained via interviews from a selected sample of SMEs (Appendix G) revealed that culture is a key determinant of the adoption of e-procurement in Saudi Arabian SMEs. Further analysis reveals that there are four elements that are related to the cultural aspect of e-procurement adoption in Saudi Arabian SMEs and are therefore included in the proposed extended model. The extended dimensions (elements) of the cultural factor include organisational culture (CU1), cultural inertia (CU2) and the business environment and culture of the country (CU3).

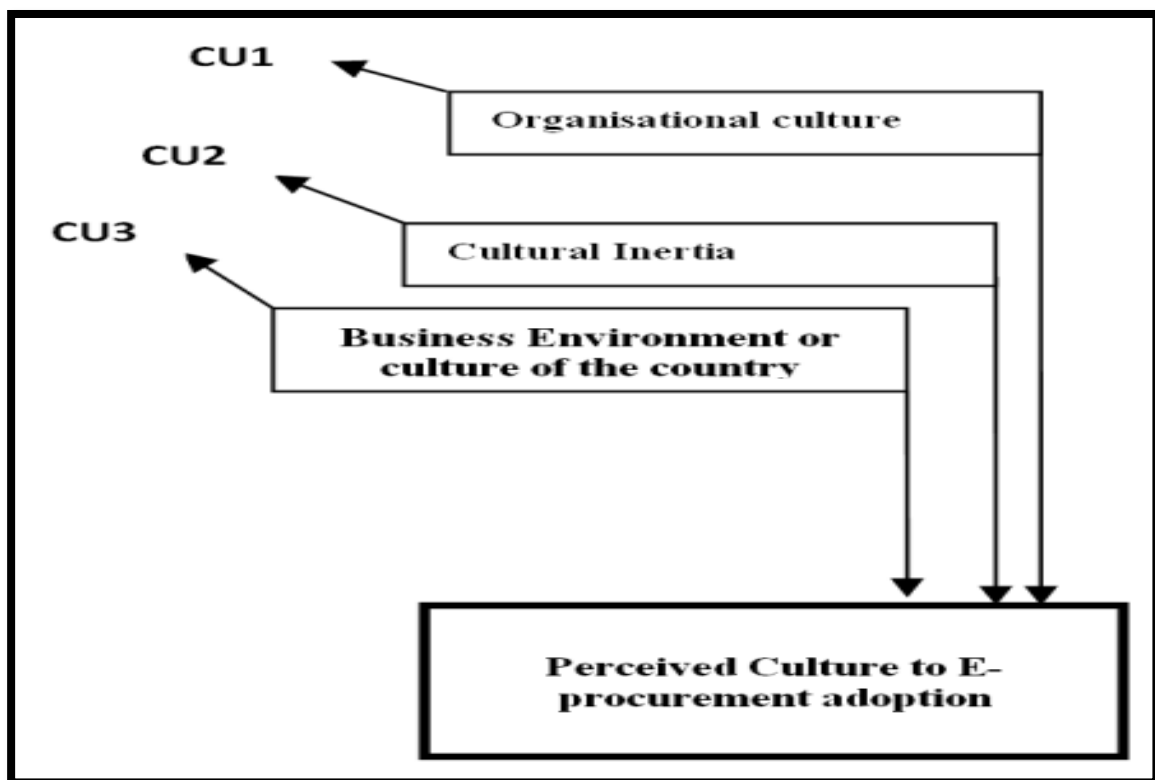


Figure 7 .2: Perceived Cultural Elements of the Extended Model

#### 7.6.6.1.1 Organisational Culture (CU1)

Interview responses obtained from selected sample of SMEs reveals that organisational culture is a key cultural traits/element that affects the adoption of e-procurement (appendix G). For example, the head of IT in company 1 (HITC1), when asked about additional factors relevant to the adoption of e-procurement, responded that organisation culture affects the adoption of e-procurement, as some organisation cultures are more suitable for the adoption of e-procurement while others are not (appendix, G). From Chapter 6, it is evident that in relatively small SMEs, top management are mostly owners, who make the decisions, and their educational background and exposure matters the most and is therefore reflected in organisational culture. Analysis of the interview sample reveals that approximately 70% of the respondents understand that organisational culture is a key cultural dimension that is perceived to affect the adoption of e-procurement in Saudi Arabian SMEs.

Previous studies on the effect of culture on technology adoption confirm and complement the importance of organisation culture. For example, Straub et al. (2002) found that the efficiency and effectiveness of an ICT's adoption in an SME is affected by its cultural, social and behavioural characteristics and insists that a clear understanding of these characteristics is vital. Similarly, Im et al. (2011) and Cheung et al. (2013) have stated that organisation culture is a very important element in understanding and explaining the social, cultural and behavioural interactions of people in the organisation setup with new technology adoption (including e-procurement). Further, a recent study by Alkinani (2010) on the adoption of e-commerce in the Arab world reveals that organisational culture is a determinant of the cultural readiness of an organisation for the adoption of new innovative technology. He further reveals that people's language of communication within an organisation and their level of IT skills, experience and exposure to other cultures create the overall culture of an organisation and together these factors affect the adoption of technology. Since an organisation's culture is created by the people working in it, Jayewardhena (2004) has used the value attitude model and has found that the collective attitude of individuals in an organisation towards the adoption of e-procurement determines the level of success and acceptance in the organisation. Other studies, such as those by Haag et al. (2009) and Calisir et al. (2014), also confirm these findings that values and behaviour influence overall culture and knowledge development in an organisation.

#### 7.6.6.1.2 Cultural Inertia (CU2)

Another key culture dimension or element that can be extracted from the interview sample (Appendix G) is cultural inertia i.e. resistance to change in the organisation's culture. As stated by the head of Ahmed Bamaroof cultural inertia is expected to be higher for e-procurement as compared to other technologies because it not only affects the organisation but also partners and supplier firms as well (Appendix G). Further analysis of interview statements reveals that religion, language, current working norms, skills and experiences are key cultural traits that contribute to cultural inertia and are perceived to impact the adoption of e-procurement: approximately 65% of those interviewed mentioned this factor in their responses.

Previous studies in the literature confirm the existence and importance of cultural inertia. For example, Iqbal (2011) found in a recent study on the adoption of e-commerce in the Arab world that people lack the relevant skills for the use of innovative technology and therefore resist the adoption of innovative new technology. In contrast, however, Mathews (2010) states that technical skills are the least important and other cultural traits (such as change in work norms, language, religion etc.) are the key reason for this cultural inertia. Khaflan and Alshawaf (2004) have also found that security, privacy, lack of trust and traditional working norms contribute to the cultural inertia that resists the adoption of innovative technological application. La-Monica, in a recent study, has confirmed that cultural inertia exists even in the wake of people's unhappiness with existing technology.

#### 7.6.6.1.3 Business Environment and culture of the country (CU3)

The interview sample obtained from selected SMEs (Appendix G) also reveals that the business environment (i.e. political instability, economic instability etc.) in which the SMEs operate also affects their adoption of e-procurement, as does the national culture of the country. This can be seen from the statement (Appendix G) of the head of procurement department in company Ahmed Bamaroof , who stated that national culture as well as the business environment of the country, which contains traits such as per capita income, GDP, the presence of multinationals and political stability, affects the adoption of e-procurement in SMEs.



This can be confirmed by previous studies in the literature: for example, on the importance and impact of the business environment, Lynch et al. (2012) stated that in a stable political and economic environment, change does not take place quickly, as people are happy with their current means, while in an unstable environment it takes place quickly because people are looking for alternative means. Similarly, Vecchiato (2012) has found that a highly competitive environment and especially the presence of MNCs tends to lead to a quick adoption of new and innovative technology for change, while in a less competitive environment, such adoption is slow. Other studies by Vohra et al. (2015) and Brdness (2013) also confirm that new technology requires a conducive national culture which accepts and appreciates such changes. Similarly, studies conducted in different cultures such as those by Hawkin et al. (2004) in Australia, Forrester (2003) in the USA, Eadie et al. (2007) in Northern Ireland and Wescott and Mayer (2002) show that national culture and business environment have an effect on the adoption of any innovative technology. According to Cheng et al. (2004), employees' empowerment is key to the adoption of e-procurement and other innovative technology, while Al-Kinani (2010) argues that the Saudi business culture is low in employees' empowerment, although the government has made some positive advances in recent times that encourage such empowerment.

#### **7.6.6.2 Perceived external factors that influence e-procurement adoption in Saudi Arabian SMEs**

Analysis of interview statements from the selected sample of SMEs also revealed that there are some key external factors that affect the adoption of e-procurement. As can be confirmed from (Appendix G), these external factors are beyond the scope of SMEs, whose owners will find it hard to adopt e-procurement unless these external factors are fulfilled. The key external factors revealed are as follows:

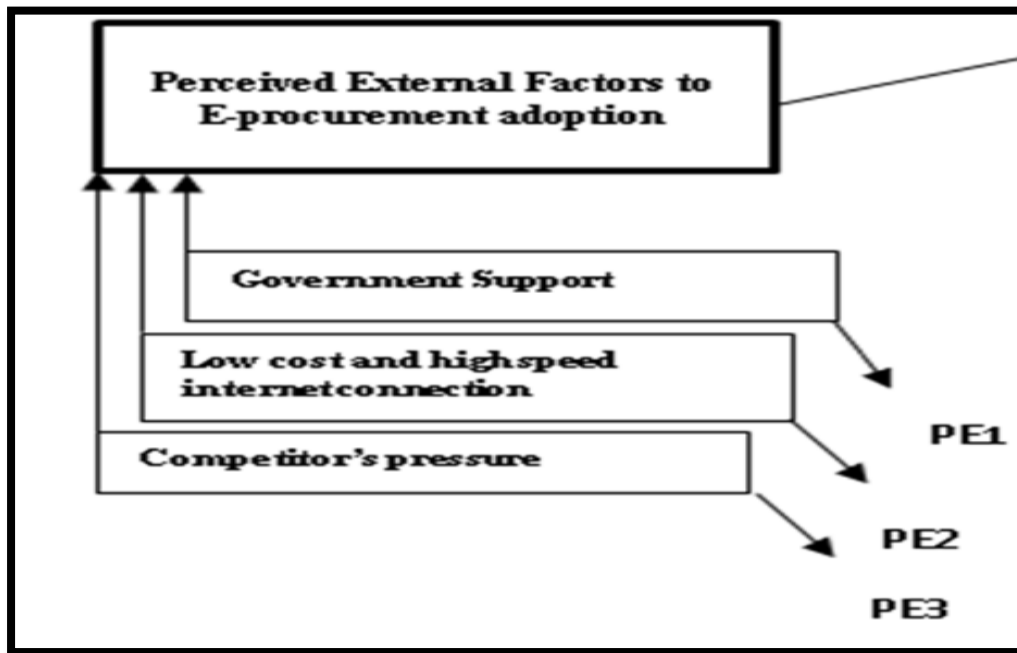


Figure 7.3: Perceived External Elements of the Extended Model

#### 7.6.6.2.1 Government Support (PE1)

Government support is found to be one of the most important factors in e-procurement adoption and more than 95% of the study participants highlighted it in their interviews (Appendix G). This can be confirmed from the interview statements in (Appendix G). The interview statements reveal that government support is widely needed in many ways, such as financial support for SMEs, improvement of internet and other infrastructure, providing IT education and training, secure payment options and providing legal and intellectual property protection. It is evident from the interview statement (Appendix G) of the head of Ahmed Bamaroof that the Government's role is vital and multi-dimensional and affects SMEs in many ways, such as providing finances, cheap and fast broadband, legal and intellectual property protection and many more.

The importance of government support in SMEs' adoption of innovative technology such as e-procurement is widely discussed in previous studies. Chen et al. (2012) confirm that government support is vital and affects SMEs in many ways, especially when it comes to skills and finances, because SMEs are mostly not very sound financially and therefore often cannot afford expensive staff or technology. Similarly, Chen and McQueen (2008) have

stated that government support is vital in building people's trust in electronic procurement because many people have their doubts. Angeles and Nath (2015) understand that adoption of e-procurement and other innovative technology is positively related to the availability of a skilled and educated workforce: therefore, special IT courses and workshops need to be established by government to promote e-business for businesses as well as individuals.

#### 7.6.6.2.2 Low cost and high speed internet connection (PE4)

Low cost and high speed internet is another key external factor mentioned by many study participants in their interview statements. Approximately 60% of the participants were not happy with the quality and speed of the internet and approximately 70% of them believed that the cost is too high. According to the head of IT in Saudi Suzuki, the current internet facility is both slow and costly for SMEs, especially in small cities, where in many areas there is no broadband facility (Appendix G).

Low cost and high speed internet has also been discussed in many previous studies: for example, Rajkumar (2001) and Croom and Brandon-Jones (2004) understand that a reliable and cheap internet connection is the most important pre-requisite for e-business. Croom and Brandon-Jones (2004) further found that there is a positive relationship between the speed, cost and adoption of e-business activities.

#### 7.6.6.2.3 Competitors' pressure (PE6)

Competitors' pressure is found to be key external force in SMEs' decisions about adopting e-procurement and approximately 50% of study participants mentioned this factor in their Interview statements. According to the head of Saudi Suzuki, competitors' pressure is a key external factor that forces SMEs to adopt innovative technology so that they can compete effectively. He further stated that businesses normally accept innovation at a quicker speed in a highly competitive environment than in an environment where there is less or no competition.

Previous research confirms and compliments this finding: Tasia (2012) has found that SMEs turn to innovative technology in order to reduce cost and time and increase business efficiency or to provide better quality of products and services compared to other competing firms. Similarly, Sila (2013) has found that there is a positive correlation between extent of competition and SMEs' adoption of innovative technologies.

### 7.6.6.3 Current status and readiness for adoption of E-procurement in Saudi Arabian SMEs

#### 7.6.6.3.1 Current e-procurement activities (CR6)

Qualitative data analysis of data reveals, as discussed on chapter 6, that in addition to the factors of the Gunasekaran and Ngai (2009) model, an additional element, “current e-procurement activities” (CR6), is relevant and necessary for the adoption of e-procurement in Saudi Arabian SMEs. The importance of current e-procurement activities is supported by previous studies such as the findings of Patrizio et al. (2004), who stated that existing electronic activities help in improving people’s skills and abilities and facilitate the uptake of e-procurement.

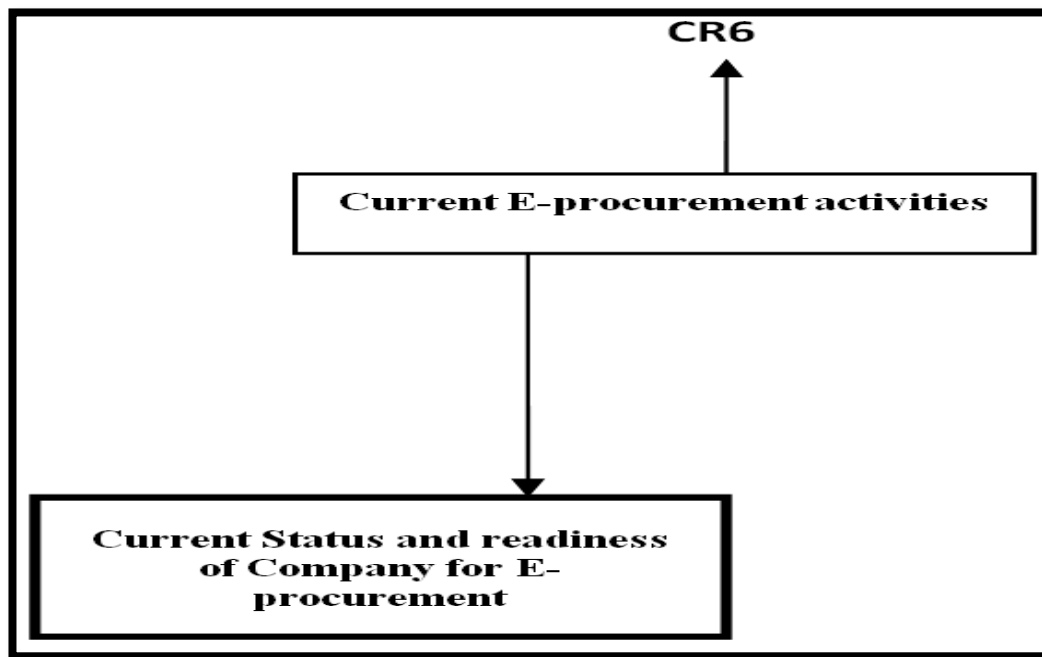


Figure 7.4: Current Status and Readiness Element of the Extended Model

From Shemi (2012) and Daniel (2003), it can be found that e-procurement is a gradual process whereby SMEs and other organisations gradually progress from e-mail to websites to e-commerce in a market to online buying and selling to integrated supply chain, and thus the current use of a technology depicts how quickly and effectively an organisation can adopt e-procurement. Molla and Licker (2005) have highlighted six different stages of e-

readiness depending on the organisation's extent and usage of technology at each stage. The stages they highlighted are as follows:

- Not connected to the Internet and no e-mail activity;
- Connected to the Internet and having e-mail but no Web site;
- A basic static Web site that publishes information about the company and its products;
- Interactive Web presence connected to product database;
- Transitive Web presence where business transactions can take place;
- Integrated Web presence: that is, a Web site that is integrated with suppliers and customers.

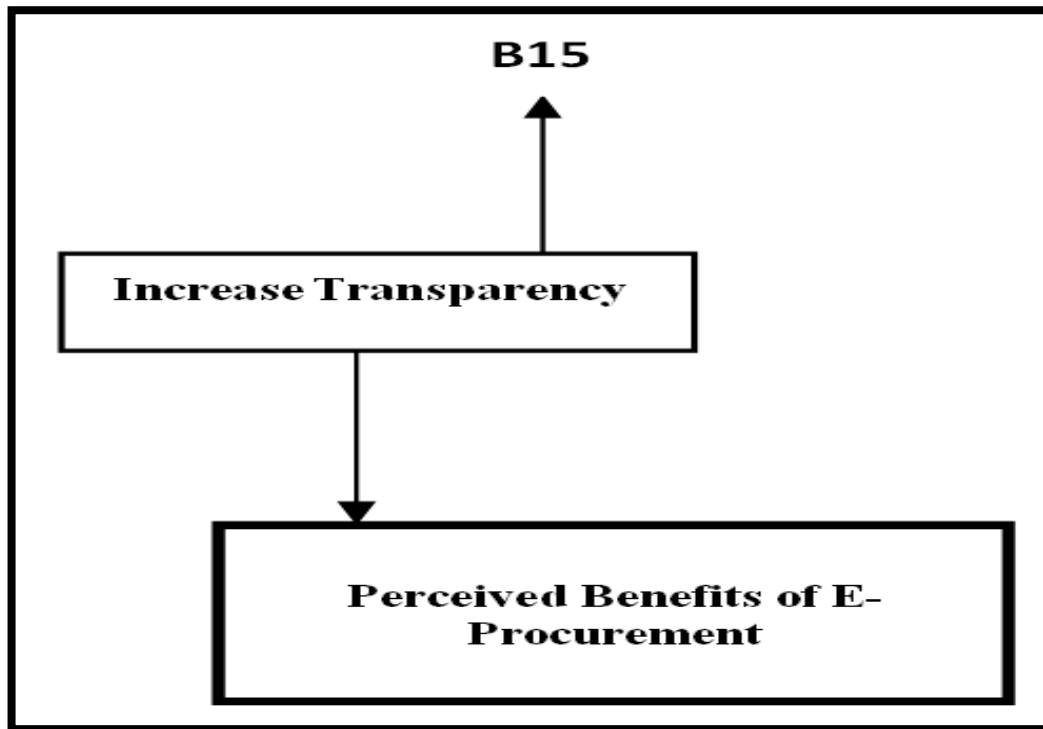
Other previous studies, such as the work of Donner and Escobri (2010), have found that current use of technology or e-procurement activities can predict an organisation's future adoption of e-procurement.

#### **7.6.6.4 Perceived benefits of adoption of e-procurement in Saudi Arabian SMEs**

##### **7.6.6.4.1 Increased transparency (B15)**

Qualitative data analysis in chapter 6 found that most of Gunasekaran and Ngai's (2009) factors were supported, but additionally found that e-procurement adoption leads to "increased transparency" (B15), which was not highlighted by Gunasekaran and Ngai. This new factor is backed up by literature findings: for example, Anderson (2009) stated that e-procurement allows for transparency in bidding, and thereby allows accountability and eradicates price fixing. Similarly, Bertot et al. (2010) found that e-procurement eliminates collusive bidding and corruption and ensures transparency in the supply chain, which they also regard as a relationship-strengthening factor between the supplier and the firm. Mahmood (2010) and Kaliannan et al. (2009) found that e-procurement overcomes the inherent weaknesses of lesser negotiation and transparency in traditional procurement systems and leads to improved accountability and transparency. Gordon (2009) understands

that transparency can be achieved via e-procurement adoption and leads to better and more factual pricing and reduced transaction timings.

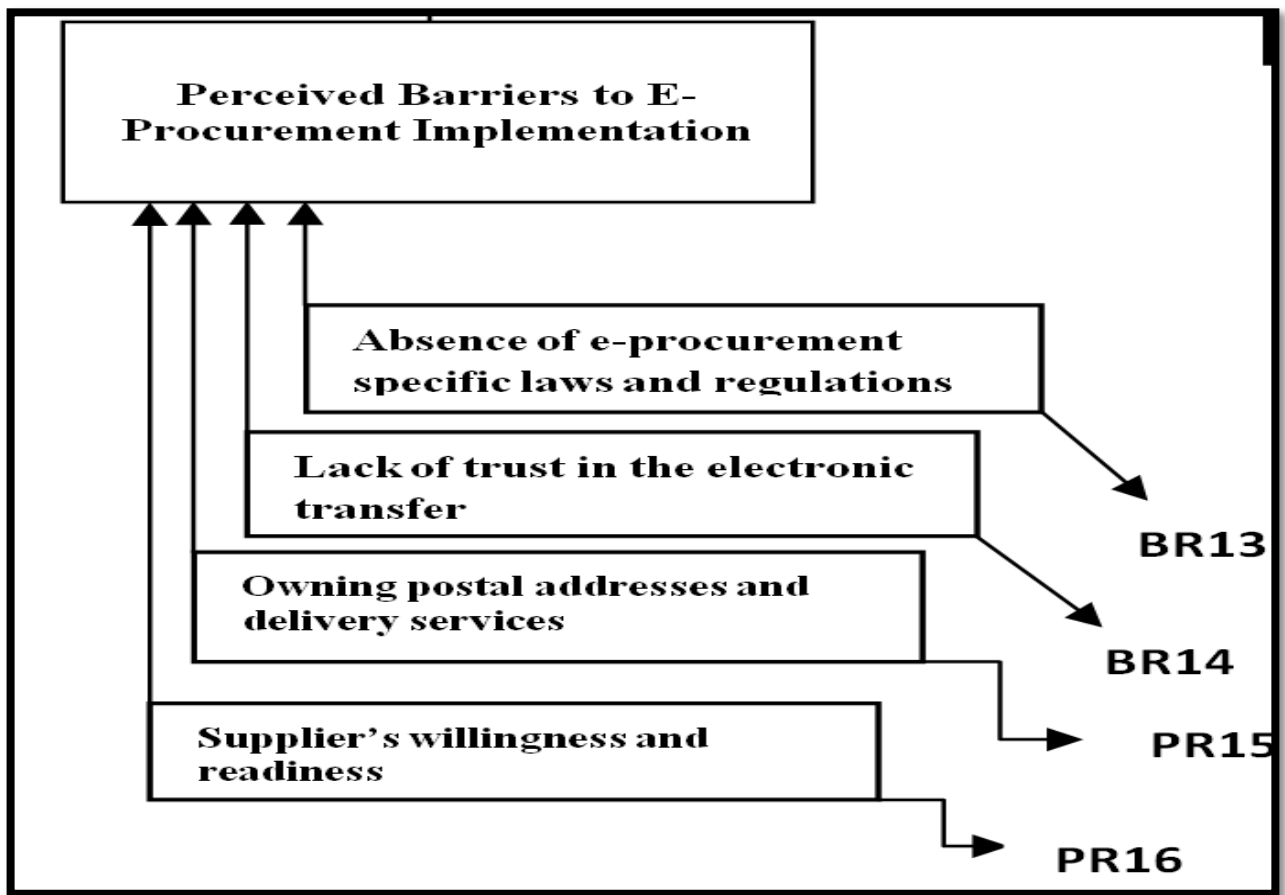


**Figure 7.5: Perceived Benefits Element of the Extended Model**

The majority of the interview respondents (approximately 70%) stated that e-procurement benefits individual staff as well as overall organisation efficiency and develops transparency, overcoming inefficiency and corrupt practices. The head of Ahmed Bamaroof highlighted the positive impact of e-procurement on transparency. This is consistent with the findings of Bertot (2010), who have stated that transparency and eradication of corrupt practices is an important social and cultural norm of Saudi Arabia, a nation governed by the law of Sharia, which emphasises justice and eradicates corrupt practices.

#### **7.6.6.5 Perceived Barriers to the Adoption of E-procurement in Saudi Arabian SMEs**

The study has found that there is some key hindrance or barriers to the adoption of e-procurement that must be overcome in order for SMEs to adopt e-procurement. The research key aim is to identify barriers particularly the tangible barriers to e-procurement adoption. The study has used qualitative research methodology to identify those barriers and then used quantitative study to quantify the relative importance of those barriers. The study has also done a comparison of those barriers with GN (2009) study to compare how the affects of these barriers are different than the original study. In this section the study specifically concentrate on the barriers specific to Saudi Arabian SMEs. Qualitative data analysis to a bigger extent confirms the quantitative findings and further shows that "absence of e-procurement specific laws and regulations"(BR13) and "lack of trust in the electronic transfer of funds" (BR14), "Owning postal address for delivery BR15", "secure and trusted online payment options" and "supplier willingness and readiness" were relevant and very important for the adoption of e-procurement.



**Figure 7.6: Perceived Barriers Elements of the Extended Model**

#### 7.6.6.5.1 Absence of e-procurement specific laws and regulations (BR13)

The analysis of data across six selected Saudi Arabian SMEs found various factors and trends that were mostly relevant to Gunasekaran and Ngai(2009) but had certain variations. One was the absence of procurement specific laws that wasn't found in the GN (2009) study in south east coast and here more than 80% of the study respondents identified this element of the barrier factor. The author therefore included this element in the extended model. The interview data further confirmed the absence of the law and its importance for the adoption of e-procurement. For example the head of Ahmed Bemarouf mentioned that this element is very important and the government has done very less in this regard so as to make the adoption easy and beneficial for the firms interested.

The absence of comprehensive procurement laws is in line with the international standards and is important to resolve and overcome conflict amongst the firms. Many previous



studies have not only confirmed this but have termed it very important. For example Engstrom et al (2009), Uyrre and Flanagan (2010) and also Teo et al (2009) believes that absence of procurement related laws can pose serious hurdles in firms adoption of e-procurements. Turban et al (2015), stress that procurement specific laws increases the confidence of both buyers and suppliers and give them confidence to indulge into fear business. They further stressed that while making laws both local and international business legislations should be taken into consideration because it takes business beyond the geographical boundaries.

While making laws and regulations it is vital that these laws are consistent internationally because e-procurement takes a business beyond the traditional geographical boundaries to interact with customer and suppliers globally and in case of conflict inconsistency with international laws can be of great significance. While referring to the importance of this consistency the head of KA mentioned that it will be vital to overcome and settle disputes smoothly. The importance of internationally consistent laws has been stressed by many researchers in previous studies such as Gatautis and Vitkauskite (2015) who found that it is vital for business entrance into global online market. Many Asian countries have already modified and modelled their laws into international framework such as Malaysia and china but Arab countries including Saudi Arabai are a little behind in this regard and should be done in order for SMEs to smoothly adopt e-procurement and enter global business arena (Rehman et al , 2012).

#### 7.6.6.5.2 Lack of trust in the electronic transfer of funds (BR14)

SMEs lack of trust and confidence in current e-payment options is another very important element which most study participants referred to in their interview and funds it extremely vital for SMEs adoption of e-procurement in Saudi Arabia. More than 65% study participants showed their dissatisfaction with available payment and transaction options in the country. The head of Ahmed Bamaroof stated that SADAD has gained some reputation in recent times but masses still are not aware of its services in distant parts of the country. This lack of trust is inherent and deeply rooted into the countries culture and is evident from the countries higher score on uncertainty avoidance using Hofsted's culture dimensions

(Hofsted, 2010). Less knowledge and awareness of the innovative IT tools in the country and media stories about online fraud further complicates the situation for businesses and customer and thus their lack of trust in the existing payment options is understandable. Thus more global online transactions partners must be allowed and the infrastructure and laws need to be strengthened together with more education, training and awareness exercises in order for e-procurement to be adopted by SMEs.

Many studies have shed lights on this barrier e.g. Mercer (2005) stressed on the value of having many alternative payment options particularly those that have global experience such as PayPal to be available as they have experience and people have trust in them. Mahmood (2013) thinks that increasing awareness and strengthening e-fraud laws can be of key significance in building people's confidence in this regard. Olatokun and Kebonye (2010) have also stated that lack of it education in the country and improvement in infrastructure are key to the increase in uptake of SMEs in e-procurement and other online tools. Beynon and Davies (2013) have found trusted online payment system and wider options of such services exceptionally vital for e-procurement. Al-Ghamidi (2011) stated that although credit service have been started by most banks and financial institutes but it is only available to people having a certain income and thus masses do not have access to it and thus a relaxation in conditions is required. Brdesess (2013) have highlighted many weaknesses in payment infrastructure of the country and have specifically highlighted that the interface must be Arabic language as most people find English hard to understand. Alrawy and Sabry (2009) also understand language very important for online payment.

#### 7.6.6.5.3 Own postal addresses and delivery services

From the respondents interview it was also found that lack of proper delivery services and own postal code is important for in time delivery. More than 55% of study participants referred to this barrier and stated that current postal system is unreliable and doesn't fulfil the need the needs of online business. The head of IT in Saudi Arabia stated that although the Government has recently started using GIS system to assign addresses but it is at infancy stage and more work is needed.

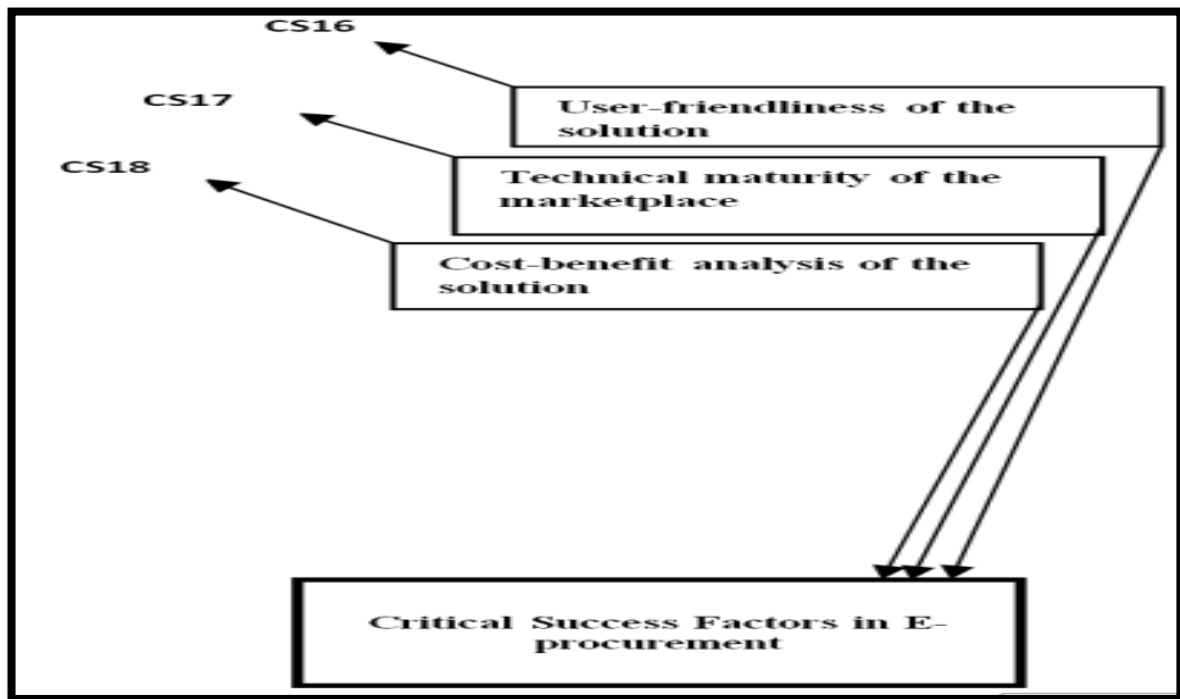
The importance of own postal addresses is evident from previous studies and literature. Belanger and Hiller (2006) have stated that own postal service and delivery is the backbone of online business. Similarly Alfuriah (2008) has mentioned that current system is very costly where one need to buy and subscribe to a mail box, however this service is also only available in bigger cities. The premier delivery service in Saudi Arabia “WASEL” has recently updated its service and now provides six different options for customer such as e-stamps, online tracking and e-mail notification etc that customer can subscribe to. However these services are only available in bigger cities (Alriyadh, 2013).

#### 7.6.6.5.4 Suppliers’ willingness and readiness

Supplier and SMEs are the key actors in e-procurement and both must be willing to adopt e-procurement or else it won’t takes place. 60% people responded that supplier should either have already adopted e-procurement or be willing to adopt and approve it for a SMEs adoption of e-procurement. The head of Ahmed Bamaroof stated that SME’s relying on local supplier will particularly find it hard to adopt e-procurement but those dealing with foreign supplier in developed countries will find it comparatively easy as is evident from NWWC and ITC adoption of e-procurement who deal with renowned European and western suppliers. Sila (2013) has stated that most SMEs in spite of willing to adopt e-procurement succumb to supplier resistance and thus fail to adopt e-procurement. GlasGustmedl (2015) has stated that there is a positive relationship between suppliers’ willingness and SMEs adoption of e-procurement.

#### **7.6.6.6 Critical success factors in the adoption of e-procurement in Saudi Arabian SMEs**

The results of the qualitative data analysis were broadly in line with quantitative data analysis, but further revealed three additional factors, namely cost-benefit analysis of the solution (CS16), technical maturity of the marketplace (CS18) and user-friendliness of the solution (CS18), as is evident from the interview responses in Chapter Appendix that were not considered by the quantitative data analysis or by Gunasekaran and Ngai (2009).



**Figure 7.7: Perceived Critical Success Factors of the Extended Model**

#### 7.6.6.6.1 Cost-benefit analysis of the solution (CS16)

This extended dimension/element of the critical success factors was mentioned by many study participants (approximately 60%), mostly top management and those in the procurement and accounts sections, as can be verified by the interview transcripts in Appendix G. One of the participants, the head of procurement in Ahmed Bamaroof, stated that firms cannot just adopt e-procurement merely because it has been successful in other parts of the world, but rather need to undertake cost benefit analysis, and will go ahead with this solution only if it beneficial in their own particular context.

The importance of a company conducting its own contextual analysis for costs and benefits has been stressed by many other previous studies, including a recent study by Angels and Nath (2015), who found that a solid business case in favour of e-procurement adoption, analysing its benefits, must be prepared and approved in order to justify the adoption of e-procurement in SMEs. Similarly, Mahdillou and Akbary (2014) also emphasise the importance of cost/benefit analysis where the perceived benefits and functionalities

achieved versus the cost incurred must be clearly shown. Weerakkody et al. (2013) have also found this to be very important and have listed many costs that the business needs to measure and quantify before the adoption of e-procurement. They found that e-procurement involves many costs, such as the cost of installation, the cost of technical architecture, the cost of skills and expertise that need to be hired, service, maintenance and other hidden costs.

#### 7.6.6.6.2 Technical maturity of the marketplace (CS17)

Another critical element of the extended critical success factors found by the study is the technical maturity of the marketplace. Approximately 57% of the study participant mentioned this element in their interview statements, as can be verified by the interview statements in Appendix G. The head of procurement Saudi Suzuki, for example, stated that e-procurement needs a technically mature market, where skilled people are available, technically sound suppliers are available and where the payment and other communication infrastructure is secure and available to the majority of target customers. Accordingly, an analysis or business case of market maturity must be conducted to justify the adoption of e-procurement and its relative chances of success. Previous studies have highlighted the critical nature of market maturity and its importance for the future success of e-procurement adoption. Khorana et al. (2014) have found that e-procurement is an integrated solution where the viability and technical maturity of all stakeholders, such as suppliers, partners, payment organisations, legislators and others, need to be evaluated. They further stated that mere technical and infrastructural strengths of the SME itself are not enough. Similarly, from Khanapuri et al. (2011) and Kaliannan et al. (2009), it can also be affirmed that total market maturity is necessary for the adoption of e-procurement. Further, Ghamidi (2012) found that the Saudi market is yet to achieve full market maturity in all aspects.

#### 7.6.6.6.3 User-friendliness of the solution (CS18)

User-friendliness of the solution is another aspect of the extended model found in this study. This element can be verified by the interview statements in Appendix G as well as by other elements such as lack of skills, lack of IT educational programs and the cultural barrier

of language (Appendix G). More than 75% of study participants understood that a user-friendly solution will be needed for the successful adoption of e-procurement in Saudi Arabian SMEs. As can be verified by the interview statement of the head of procurement in KA, help facilities and user-friendly icons and texts were found to be very important for the successful adoption of e-procurement.

Previous studies and e-procurement literature also verify the critical nature of this element/dimension: for example, Isikdag et al. (2011) found that user-friendliness is extremely important, especially in developing countries where the culture is not fertile for the adoption of technology. This obviously holds true for Saudi Arabia, as has been stated in Chapter 7. Similarly, Ronchi et al. (2010) stated that there is a positive relationship between user acceptance of the solution and its user-friendliness. This is again of key importance in a country where there are fewer skilled people and help will be needed. Other studies, such as those by Teo et al. (2009), Eadie et al. (2011) and Ronchi et al. (2010), have stressed the critical nature of this element for the adoption of e-procurement.

### 7.6.6.7 Future organisational performance of adoption of e-procurement in Saudi Arabian SMEs

The qualitative findings discussed on chapter 6 and 7 seem to be in line with the qualitative data findings but reveal two additional elements that were not highlighted by Gunasekaran and Ngai (2009) and were not even considered by the quantitative data analysis, namely strategic alliance and networking (FQ7) and knowledge management and data warehousing (FQ8).

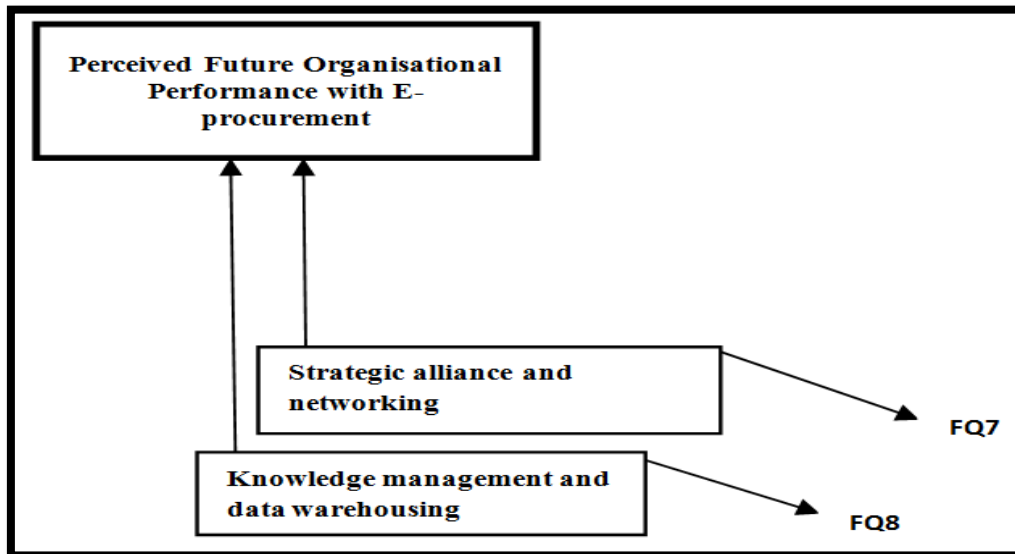


Figure 7.8: Perceived Future Organisational Performance Elements of the Extended Model

#### 7.6.6.7.1 Strategic alliance and networking (FQ7)

The importance of strategic alliance and networking for future organisational performance and its relevance to e-procurement adoption is confirmed by Knudsen(2003), Ritter et al. (2004), andWalker et al. (2013). Kar (2009) has found that transparency and accountability in the supply chain through e-procurement adoption leads to new strategic relationships wherein the buyer and supplier depend on each other for their success. Walker et al. (2013) extended this further, stating that e-procurement leads to information and knowledge availability about different suppliers and buyers, which benefits everyone in the network and not just specific firms: thus, a wider strategic network is created in the industry.

#### 7.6.6.7.2 Knowledge management and data warehousing (FQ7)

The ability of e-procurement to improve knowledge management and data warehousing can be confirmed from Walker et al. (2013), who found that e-procurement leads to the availability of information and knowledge about different suppliers and buyers, which benefits everyone in the network and not just specific firms: thus, a wider strategic network is created in the industry. Mahdillou and Akbary(2014), in their research on the costs and benefits of e-procurement, stated that since key product information is hard coded within an e-procurement system, this allows ease of accessibility and reduces errors that can be made in managing product-related information. They further stated that e-procurement provides detailed and high quality product management information and also reduces the need for data mining or data warehousing. Chipiro (2010) understands that this knowledge and management of information will be instrumental in improving SMEs' services to the end user and dealing with suppliers because business activities can be effectively monitored and managed based on this information and actions can be taken in a timely manner.

### **7.7 Summary**

Analysis of qualitative data from selected sample of Saudi Arabian SMEs revealed that in addition to five factors of Gunasegaram and Ngai (2009) model, there are two additional key factors i.e. perceived external factors and perceived cultural factors that affect the adoption of e-procurement. As can be confirmed from the analysis of responses external factors refer to all those factors that are beyond the scope and control of SMEs and affect their adoption of e-procurement. Detailed analysis of interview statements from selected sample of SMEs allowed us to establish the following three elements of the perceived external factor

- Government support
- Low cost and high speed internet connection
- Competitor's pressure



Similarly analysis of interview statements also revealed that culture plays a vital role in SMEs adoption of e-procurement in Saudi Arabia. Three key elements were found in cultural context that affects the adoption of e-procurement i.e.

- Organisational culture
- Culture inertia
- Business environment or Culture of the country

This lead us to the proposed extended GN model that takes into consideration the new elements found in relation to each of the five factors and adding two new factors i.e. perceived cultural factors and perceived external factors affecting the adoption of e-procurement as shown in figure (7.1).

The study thus met it objective of exploring additional factors that affects the adoption of e-procurement in Selected Sample of Saudi Arabian SMEs by establishing six elements of the perceived external factors and three elements of the perceived culture factors and justified it from wider e-procurement literature.

The study therefore assert that the proposed extended model is ideal for exploring the factors affecting the adoption of e-procurement and can also be used for the adoption of other innovative technologies in SMEs in Saudi Arabia and other Arab countries.

## Chapter Eight

### 8 Conclusion

This chapter presents a summary of the findings from the analysis and discussion of this study. First, it presents a brief overview of the research methodologies. It then revisits the aims and objectives of the study, and highlights its contribution to the existing literature and knowledge. Furthermore, this chapter briefly discusses the theoretical, academic and practical implications of the research and also presents its limitations. Lastly, it suggests directions for future research in the area.

#### **8.3 Research aim and objectives revisited**

This research aimed to investigate the factors affecting the adoption of e-procurement in Saudi Arabian SMEs. The research had the following specific objectives:

1. To explore the current status or readiness of selected Saudi Arabian SMEs for e-procurement adoption using the Gunasekaran and Ngai (2009) theoretical model.
2. To evaluate, and if appropriate, modify the Gunasekaran and Ngai (2009) model to conceptualise the benefits and barriers to adoption of e-procurement within selected SMEs in Saudi Arabia and explore additional factors that might affect the adoption of e-procurement in selected Saudi Arabian SMEs and modify the model accordingly.
3. To investigate critical success factors for the adoption of e-procurement and examine their effect on e-procurement adoption in selected Saudi Arabian SMEs using the Gunasekaran and Ngai (2009) model.
4. To examine the future perceived organisational performance in Saudi Arabian SMEs with the adoption of e-procurement using the Gunasekaran and Ngai (2009) model.
5. To provide directions and recommendations for future research.

#### **8.4 Overview of research process and methodology**

In order to fulfil the aforementioned objectives, an extensive literature review was conducted that developed into the theoretical framework. The methodology adopted to collect data for this research consisted of the following three main stages:

- First of all, an exploratory study was carried out to collect and analyse data on a smaller scale to get an understanding of the issues and to check the validity of the tools and model in the context of Saudi Arabian SMEs;
- A detailed study was conducted using Qualitative (interview) and Quantitative (questionnaire) methodologies to get an insight into the factors that affect the adoption of e-procurement in Saudi Arabian SMEs using the Gunasekaran and Ngai (2009) model;
- Based on the outcome of interviews and questionnaires, case studies were established and reviewed through the literature.

The initial literature review allowed the researcher to select a suitable model for the study and an exploratory (pilot) qualitative study was conducted across three selected SMEs to test its validity and efficacy and to clarify various issues. Interview questions were a combination of structured and semi-structured questions and twenty-seven selected personnel were interviewed. All interviews were conducted in Arabic and the results were audio-recorded. The pilot study helped in identifying factors that affect the adoption of e-procurement in Saudi Arabian SMEs and laid a foundation for the development of a framework for a detailed study. The initial study helped in modifying the Gunasekaran and Ngai (2009) model to integrate the cultural aspects and external factors to fully understand and investigate the underlying factors affecting the adoption of e-procurement in Saudi Arabian SMEs.

Secondly, a detailed study was conducted using both quantitative and qualitative methodologies to collect large-scale data from Saudi Arabian SMEs. The key aim of the study was to validate the theoretical framework and model. The framework was the output of an extensive literature review and a preliminary pilot study. Semi-structured interviews (qualitative methodology) and questionnaires (quantitative methodology) helped in

achieving the research aim and objectives. The study found perceived cultural and perceived external factors relevant to the adoption of e-procurement and also found a few new elements for each of the existing factors as shown in figure. Based on its findings the study establishes that the proposed extended model is ideal for investigating the factors that affect the adoption of e-procurement in Saudi Arabian SMEs.

The study concludes that the proposed extended model is ideal and applicable for investigating the factors that affect the adoption of e-procurement in Saudi Arabian SMEs. The study findings from the analysis of both quantitative and qualitative data can be used for the effective adoption of e-procurement in Saudi Arabian SMEs. The findings and recommendations of this study will help in overcoming the barriers and critical success factors and understanding the benefits and future performance perspectives of e-procurement adoption. They will also help in understanding external factors and the cultural perspective of e-procurement adoption, which can be used as reference for future research in this field.

### **8.5 Explanation of how the study has met its objectives**

The research has been successful in achieving its aim and specific objectives, which are explained as follows:

**The first objective** of the research was to explore the current status or readiness of selected Saudi Arabian SMEs for e-procurement adoption using the Gunasekaran and Ngai (2009) model. This objective was partially met in the exploratory (pilot) study where staff and management of three different SMEs were asked about the use of different technological tools such as websites, e-commerce models, the internet and others in their respective SMEs. The exploratory study not only confirmed the current use of technology but also asked questions about their perceptions and attitudes towards the use of technology. This data was further elaborated in much detail with empirical evidence using quantitative data collection (AHP analysis) as well as qualitative data collection and analysis and it was found that only two of the six selected SMEs have adopted e-procurement. Overall on average selected Saudi Arabian SMEs qualify for a basic level of e-procurement readiness and have limited use of technology for procurement activities. Refer to chapter four and chapter 6

**The second objective** of the research was to evaluate and modify if appropriate the Gunasekaran and Ngai (2009) theoretical model to conceptualise the benefits and barriers to the adoption of e-procurement within selected SMEs in Saudi Arabia. This objective was met via qualitative and quantitative study which resulted in finding new elements in relation to benefits and barriers as shown in figure 7.1 .Detailed investigation using interviews and questionnaires found that most of the benefits mentioned by Gunasekaran and Ngai (2009) and the broader e-procurement literature were realised in Saudi Arabian SMEs. Further, it was found that improvement in relationships with suppliers and customers and better utilisation of staff had lower priority in Saudi Arabian SMEs, while reduction in cost, improvement in supply chain and reduction in processing time were given higher priority. Qualitative data analysis also revealed that increased transparency was an additional benefit factor found by the study in Saudi Arabian SMEs.The study established six case studies and found that only two of the six selected SMEs have embraced e-procurement. These were relatively bigger, financially stronger and had associations with suppliers in foreign countries mostly Europe and USA. The study found that cultural and perceived external factors are the additional factors relevant and important for the adoption of e-procurement and incorporated it into the extended model proposed by the study based on its findings and justification from literature.

The study findings in relation to this objective were mostly in line with GN(2009) model and broader literature on electronic procurement although there were slight variations in priority in quantitative data analysis. The Qualitative findings however found some new elements in the barrier factors such as weaker infrastructure, absence of procurement related laws and lack of trust in e-payments as some additional key barriers to the adoption of electronic payment in the kingdom.

**The third objective** of the study was to investigate and examine critical success factors and their impact on the adoption of e-procurement in Saudi Arabian SMEs. This objective was successfully met by the detailed study,in which the critical success factors from the Gunasekaran and Ngai (2009) study and the broader e-procurement literature were tested. It was established that top management involvement and collaboration with suppliers were

critical for the adoption of e-procurement in Saudi Arabian SMEs, which was consistent with the Gunasekaran and Ngai (2009) study and the broader e-procurement literature, while four additional factors, namely the user-friendliness of the solution, technical maturity of the market in terms of IT use and cost-benefit analysis of the solution were also very important.

**The fourth objective** of the study was to examine the future perceived organisational performance in Saudi Arabian SMEs in relation to the adoption of e-procurement. This objective was also successfully met by the detailed qualitative and quantitative analysis of interview and questionnaire data obtained from the study respondents. The study successfully tested elements of the Gunasekaran and Ngai (2009) model and the broader e-procurement literature and found that data obtained from Saudi Arabian SMEs is in line with the GN model. Additional elements found and tested by the study for this factor were knowledge management and data warehousing and strategic alliance and networking

**The Fifth Objective** of the study was to provide directions and recommendations for future research which is successfully established in sections (9.7 and 9.8).

## **8.6 Contributions to Knowledge**

This study is a significant addition to the repository of e-procurement knowledge in the kingdom of Saudi Arabia in particular. The research investigated the factors that affect the adoption of e-procurement in Saudi Arabian SMEs and proposed an extended model incorporating new elements found for each of the existing five factors and added the new elements perceived external factors and perceived cultural factors elements necessary for the adoption of e-procurement in Saudi Arabian Perspectives. This research is significant because there appear to be no related studies of this model in Saudi Arabia regarding the factors affecting adoption of e-procurement by SME's. This will provide a strong theoretical foundation for researchers applying the Gunasekaran and Ngai (2009) model to SME's in Saudi Arabia as this study elaborates further this research to the original study in 2009. In particular, the evaluation of cultural and external factors in e-procurement adoption is of key significance for e-procurement adoption in the Saudi Arabia. The findings of this

research will be important and will also have practical implications and will be highly beneficial for SMEs wishing to adopt e-procurement and extend the efficiencies of their business.

This study is of key significance because it has used AHP to prioritise the barriers i.e. it has ranked the barriers in order of their impact or importance for the adoption of e-procurement in Saudi Arabian SMEs. First this prioritisation of perceived barriers is significant for future research on the subject because researcher can take two or more important barriers and carryout a detailed study within various types of SMEs i.e. service, manufacturing etc and evaluate and compare their importance in these SMEs. Similarly the researcher can also evaluate and compare their impact between smaller SMEs and Medium size SMEs as well as public and private SMEs and can make a comparison of the variations in importance of these Barriers. The future Researcher cans also carryout research in neighbourin gulf countries that are mostly similar in culture and values with Saudi Arabia and show the difference in these pereceived barriers in these countries as compare to Saudi Arabian SMEs.

Similarly the outcome of the research is of key significance for the Government of Saudi Arabia because they can work on the outcome of the study Perceived barriers which are mostly external and try to minimise or mitigate them. The Government in the light of the study can make policy guidelines for e-procurement that takes into consideration the need of Saudi Arabian SMEs , their values and culture but also at the same time must be in line and consistent internationally to avoid any conflict in payment or any other contractual issues.

Last but not the least the study is of valuable importance for the SMEs owner in the country to know and understand the benefits of e-procurment adoption and work on the pereceived internal barriers in their SMEs and overcome them for their adoption of e-procurement and getting competitive advantage over other SMEs in the country.

## **8.7 Academic Implications**

To the best of the author's knowledge, this is the first study that investigates the factors affecting the adoption of e-procurement in Saudi Arabian SMEs. By applying the GN (2009) model in conjunction with other theories the study carried out thorough and detailed research into investigating five key perceived factors that affects the adoption of e-procurement in Saudi Arabian SMEs. Through rigorous qualitative research the study extended the GN model to include two additional factors i.e. perceived cultural factors and perceived external factors. This is not only the first study on investigating the factors that affects the adoption of e-procurement in Saudi Arabian SMEs but is also the only study of its kind that has replicated the GN(2009) and applied it to SMEs in a country.

This study attempts to provide a strong framework by extending the proposed GN(2009) model to integrate perceived cultural and external factors in addition to the original five factors based on interview responses of the participants and justification from broader e-procurement literature.

The study aims to get an insight into current status and readiness of Saudi Arabian SMEs for e-procurement adoption by investigating their current use of technology in the procurement department and related processes. It also investigate Perceived benefits of e-procurement adoption which also helpful in knowing people knowledge of e-procurement and its importance in their business. Further the study try to investigate critical success factors, perceived barriers of e-procurement adoption and future organisational performance factors. Qualitative interview revealed that culture has a key role in adoption of technology in Saudi Arabian SMEs, so the study has incorporated culture as well as external factors that are beyond the capacity of SMEs and have an impact on e-procurement adoption in the kingdom.

The extended model which is the first of its kind will be ideal for future research on the adoption of e-procurement or other technological innovation in Saudi Arabia in particular and the rest of the Arab world in general as culture and most of the other factors are broadly same in the Arab Gulf countries.



The study has used AHP to prioritise each of the seven factors that affects e-procurement adoption which is again a unique attempt and can be of great help for future researchers to concentrate on elements of more importance than the rest and Government to overcome those factors for maximum adoption of e-procurement.

### **8.8 Practical Implications**

The study findings have valuable implications for SMEs, their suppliers, Government agencies as well as customers. Investigation of current status and readiness, perceived critical success factors and perceived barriers will give an idea to the Government, SMEs and suppliers about the areas that need improvement in terms of policies and infrastructure for e-procurement adoption. It will also help banks, financial institutions and delivery services to work and improve their services. The results of perceived future organisational performance and perceived benefits will act as a motivating factor for SMEs and other stakeholders to work towards the adoption of e-procurement in all SMEs in the country. The study also recommends the Government to upgrade its school and college curriculum to incorporate IT at an earlier stage and also establish training institutions for these people. The study stresses on Government to increase awareness in people and organisation about the uses of e-procurement technology and its benefit.

The study has established that culture has a strong influence on the adoption of e-procurement in the country which has practical implications for the vendor to incorporate cultural factors into e-procurement solution e.g. the language must be Arabic as, most of the people do not understand English. Also the solution mustn't anything in it that conflicts the basic values and attitude of the people.

## 8.9 Research Limitations and Recommendations

This research has established a framework to investigate the factors that affect the adoption of e-procurement in selected Saudi Arabian SMEs. The framework is based on a modified version of the Gunasekaran and Ngai (2009) model to incorporate perceived cultural and external factors of e-procurement adoption. The framework was tested and validated via large-scale data obtained from staff members of four selected Saudi Arabian SMEs. However, as can be the case with any research, this study acknowledges the following limitations.

- Firstly, the exploratory study was limited to a relatively small sample size due to time constraints and ease of sampling and there is a possibility that the study might not be fully representative. Similarly, conducting interviews in any workplace is subject to time and other constraints in Saudi Arabia and the researcher selected people who were willing and easy to contact within the four selected SMEs that had granted permission for interviews and quantitative data collection. This type of convenience sampling is, however, in line with the research and data collection principles.
- The second limitation is related to the IT-related knowledge gap, as some people were more knowledgeable regarding IT tools and applications, while others had less or no knowledge of e-procurement, and the study favoured people with knowledge of IT and e-procurement.
- The third limitation of the study is related to the relatively small sample of SMEs and also respondents from within these SMEs for interviews as well as questionnaire responses. A larger sample size would have been highly beneficial. No females were present amongst the staff members of the four selected SMEs, which is another limitation of this study. However, it must be taken into consideration that Saudi Arabian women work only in specific industries and in a segregated manner, and it would be almost impossible for them to be interviewed by a male researcher.
- The fourth limitation of the study is the validity of the formwork used for investigation in the context of the Kingdom of Saudi Arabia because no previous study on the adoption of technology has used the model in Saudi Arabia or other Arab gulf countries. Though the GN (2009) model has been used in south east coast

of USA and Hong Kong but the culture and social context of those countries are entirely different. Although, the author has extended the model to include cultural factors, yet use and validity of the model in another Arab gulf country which all have same culture and values will confirm the validity of the framework. Study in another gulf country can be easily compared with this study to find its weaknesses and limitations.

- This research has solely concentrated on SMEs, future research should also take into consideration the local supplier as well, in order to understand their issues as well because that also has impact on SMEs adoption of e-procurement. The research has found in its investigation that the two selected SMEs (out of six) that has adopted e-procurement are associated with foreign suppliers which indicates that local suppliers either haven't adopted e-procurement or may have some other weaknesses that need to be investigated.
- Although there are very few SMEs with women employees or those run by women but it will still be a good idea to obtain data from those female respondents to understand the gender differences and its impact on the adoption of e-procurement or specific needs of women that must be considered in the proposed procurement solution.

### **8.10 Directions for future Research**

Based on the study objectives, findings, contribution to knowledge and implications, the author also believes that more detailed and robust outcomes are needed in future researches on the subject to tackle various other aspects of SMEs based on size and type and the area where they are established so as to get a more comprehensive outcome. Some of the key recommendations for future research on the subject of e-procurement adoption in Saudi Arabian SMEs are as follows

Firstly the future researchers must apply AHP prioritisation at every stage of intended framework so that firm conclusion can be achieved.

Secondly the future research should concentrate on more knowledgeable and experienced entrepreneurs because they have greater awareness of the subject and know the success

factors, barriers and future performance in more depth on the adoption of e-procurement. Based on their robust experience they also know the strengths and weaknesses of Saudi Arabian SMEs which can be helpful in choosing or developing an e-procurement solution for these SMEs

Thirdly the future researcher can take all or some of the perceived barriers of this study and dissect them further to find out sub barriers or factors that leads to these barriers and analyse them and find ways to overcome these barriers.

Fourthly the future researcher should take local authorities and trade unions in confidence as well and in consultation with them so e-procurement can be adopted on a larger scale.

Further the future research will focus on the limitations of this research thereby selecting a relatively larger sample of SMEs and respondents for qualitative and quantitative data collection. Similarly future research can select SMEs from various cities and towns across the country from diverse industries. Future research can also concentrate on the knowledge level and other demographics characteristics of respondents and differences in their views towards the adoption of e-procurement. The validity of proposed framework and model need to be tested in another Arab country that has similar values and culture to Saudi Arabia because it has been used in Hong Kong and Southeast Coast that completely different cultural and social context and compare with the results of this study to compare and validate the findings.

The future research must take female respondents into consideration if possible as things are gradually changing in the kingdom and women have for the first time contested and won seats in local bodies elections and their views and opinion matter. It is important to know it in the context of the kingdom of Saudi Arabia due to its conservative nature and can also be helpful in encouraging the growth and development of women SMEs

Lastly the exploratory study of the future researches should adopt interpretive qualitative method in order to highlight and evaluate other related areas that the current research hasn't highlighted or investigated. Such approach will help in understanding and overcoming some of the key limitations of this research, finding new factors and also validating the current finding.

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**Appendix A.1: CBC 2014 - Exploratory Study- ATINER'S Conference Paper Series**

**Athens Institute for Education and Research  
ATINER  
ATINER's Conference Paper Series  
CBC2014-1332**

**An Investigation into the Factors affecting  
Adoption of E-procurement in Saudi Arabian  
SMEs (An evaluation of Gunasekaran and Ngai  
2009 Model)**

**Ahmed Altayyar  
PhD Student  
University of Bedfordshire  
UK**

ATINER CONFERENCE PAPER SERIES No: CBC2014-1332

## An Introduction to ATINER's Conference Paper Series

ATINER started to publish this conference papers series in 2012. It includes only the papers submitted for publication after they were presented at one of the conferences organized by our Association every year. From October 2014, the papers of this series are uploaded after they have been reviewed for clarity making sure they meet the basic standards of academic paper presentations.

The series serves two purposes. First, we want to disseminate the information as fast as possible. Second, by doing so, the authors can receive comments useful to revise their papers before they are considered for publication in one of ATINER's journals and books, following our more rigorous standard procedures of a blind review.

This paper should be cited as follows:

**Altayyar, A. (2015) "An Investigation into the Factors affecting Adoption of E-procurement in Saudi Arabian SMEs (An evaluation of Gunasekaran and Ngai 2009 Model)", Athens: ATINER'S Conference Paper Series, No: CBC2014-1332.**

### Exploratory Study interview questions

Interview Questions	
Q1	Does your company have a website? If yes, what sort of information does your company provide on it?
Q2	What is your opinion on the use of the Internet and technology tools in your company?
Q3	What do you think about the use of the Internet in the procurement process?
Q4	Which model of E-commerce do you use for E-procurement in your business?
Q5	Which activities are supported by the current e-procurement systems?
Q6	Which kind of products or services mostly your company purchase via internet?
Q7	Could you provide information about employees in your company who are involved in the procurement process?
Q8	Could you explain the role of e-procurement in regard to your company perspective and the current level of the process?
Q9	Which technology do you mostly use for e-procurement for suppliers or customers?

# **An Investigation into the Factors affecting Adoption of E-procurement in Saudi Arabian SMEs (An evaluation of Gunasekaran and Ngai 2009 Model)**

**Ahmed Altayyar  
PhD Student  
University of Bedfordshire  
UK**

## **Abstract**

This study investigates the current state of e-procurement in Saudi Arabian SMEs in order to evaluate benefits and barriers to the adoption of the process and finally presents a conclusion. A theoretical framework for the adoption of e-procurement used by Gunasekaran and Ngai (2008) in Hong Kong and also on SMEs on the south coast of Massachusetts in USA (2009) will be applied to selected Saudi Arabian SMEs in order to understand the adoption of technology and e-procurement by these selected SMEs.

**Keywords:** E-Procurement adoption, E-Commerce, Purchasing, current status or readiness, benefits and barriers.

## **Introduction**

Information sharing, trust and communication with customers and suppliers have played a valuable role in the advancement of companies (Gunasekara et al, 2005). Such competition requires companies to adopt and use various electronic data exchange technologies such as World Wide Web, Electronic data interchange, Enterprise resource planning, the internet and E-procurement to automate and standardise various business processes. E-procurement is as important for domestic business operation as it is for global business operation (lee et al, 2008). E-procurement in SMEs has not gained much attention historically from vendors and researchers. More recently, the importance of e-procurement in international and domestic business operations has forced SMEs to adopt this approach (Arts, 2012).



Appendix A.3: Certificate of First Conference

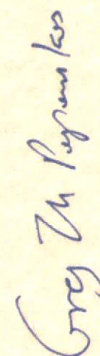
# Athens Institute for Education and Research

This certifies that Ahmed Altayyar, Ph.D. Student, University of Bedfordshire, U.K. participated and presented the paper

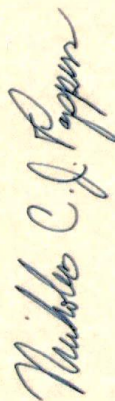
*"An Investigation into the Factors Affecting Adoption of Eprocurement in Saudi Arabian SMEs (An Evaluation of Gunasekaran and Ngai 2009 Model)"*

**8<sup>th</sup> Annual International Conference on Global Studies: Business, Economic, Social and Cultural Aspects, 18-21 December 2014, Athens, Greece**

The official program is available at [www.atiner.gr/cbc.htm](http://www.atiner.gr/cbc.htm)



Dr. Gregory T. Papanikos  
President



Dr. Nicholas C.J. Pappas  
Vice President of Academics

# **Evaluation and Investigation into the Potential Benefits of e-Procurement Adoption in Saudi Arabian SMEs**

Ahmed Altayyar  
University of Bedfordshire, United Kingdom  
John Beaumont-Kerridge  
University of Bedfordshire, United Kingdom

## **Abstract**

This paper investigates the potential benefits of e-procurement adoption in Saudi Arabian SMEs. The study's theoretical foundation is built on Gunasekaran and Ngai's (2009) model of e-procurement adoption, applied to the south-east coast of the USA. It includes an extensive literature review on e-procurement adoption to investigate further factors in the benefits category. The study uses both qualitative and quantitative tools to collect data from four selected Saudi Arabian SMEs to identify potential benefits in relation to e-procurement adoption. It also investigates the relative importance of various perceived benefit factors in Saudi Arabian SMEs using the Analytic Hierarchy Process.

**Keywords:** e-procurement adoption, purchasing, benefits, SME

## **Introduction**

E-procurement is an efficient methodology that companies can use to speed up their transaction, payment, shipment, delivery and storage procedures. It replaces the manual way of doing things with an electronic approach. It helps companies to reduce their inventory and meet customer needs by forecasting for the future based on existing data from the system. The main aims of e-procurement are to reduce time and costs and improve budgetary control, reduce management errors, strengthen the seller - buyer relationship, reduce prices, increase staff utilisation and productivity and improve information management (Hsue and Chen, 2015). SMEs hope that the adoption of e-procurement will improve efficiency and reduce costs. When an organisation strengthens its procurement tools, it can attain better contracts, customer service, procurement efficiency and total quality. As a result, improved supplier relationships, higher customer satisfaction, better quality and lower costs can be achieved, leading to better overall production and promotion in the industry (Eei et al, 2012). Furthermore, adoption leads to the acquisition of timely information through stronger inter organisational efficiency and efficient communication channels (Turban et al, 2015). More precisely, e-procurement adoption facilitates the comparison of prices from various suppliers, selection of the inventory and making orders in time to meet customers' needs. Some other benefits are improvement in procurement and operational efficiency, better utilisation of staff and reducing contract-oriented procurement. In this way, the goal of efficient procurement (reduced cost and time) and operational effectiveness can be achieved.

Appendix B.2: Certificate of Second Conference



Appendix C.1: Certificate of Third Conference

# Certificate Of Attendance



*This Certificate is Awarded to*

**Ahmed Altayyar**

On Attending & Orally Presenting His/her Paper Titled "Impact of Cultural Factors on the adoption of e-procurement in Saudi Arabian SMEs" In The 20th International Research Conference On Business Economics And Social Sciences, Irc-2015, Held In Istanbul On 05-06 December, 2015.



Conference Chair, IRC-2015

## Appendix D.1: Invitation of Company 1

**SUZUKI SAUDIA**

Ahmed M. Bamarouf

AUTOMOTIVE TRADING CO. LTD



سوزوكي السعودية

شركة التجارة للسيارات المحدودة

تجارة السيارات المحدودة

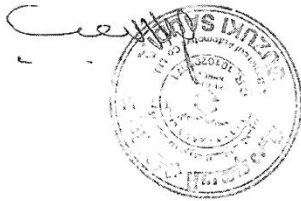
To whom it may concern

I am writing with reference to Mr. AHMED ALTAYYAR  
(Passport Number: K968873).

Mr. Ahmed is pursuing PhD research and he would like to collect data and information for the purpose of this research. I am therefore writing to inform you that we are willing to give him all data and information needed for his research. We would welcome his thoughts on this.

If you are require any further information please do not hesitate to contact us

Yours faithfully



## Appendix D.2: Invitation of Company 2



شركة الاتحاد الهندسي السعودية  
خطيب و علمي  
Saudi Consolidated Engineering Company  
**Khatib & Alami**  
License No. 323/13/72 رقم الرخصة ٧٢/١٣/٢٢٢

Our Ref. .... الرقم

Date ..... April 13, 2013 التاريخ

### To whom it may concern

In response to the request for access to our data and information by Mr. AHMED ALTAYYAR (passport no: K968873), we hereby write to inform you that we are willing to give him all the data he needs to pursue his PhD research.

Kind Regards

**Emad Faisal**  
Administration Manager



الرياض	جدة	القصير	AL-KHOBAR	JEDDAH	RIYADH
رقم العضوية غ.ت ٢٦٢٥ ص.ب ٢٩٢٨ - الرياض ١١٤٨١	رقم العضوية غ.ت ١١٨٨١ ص.ب ٩٣٠ - جدة ٢١٤١٣	رقم العضوية غ.ت ١٠١٠ ص.ب ١٧١٣ - القصير ٢١٩٥٢	Membership At C. C.: 1010 P.O.Box 1713 Khobar 31952 PHONE: 8946816 / 8942325 FAX: 8942341 E.mail: khobar@khatibalami.com	Membership At C. C.: 11881 P.O.Box 9330 Jeddah 21413 PHONE: 6143781 / 6143782 FAX: 6143764 E.mail: jeddah@khatibalami.com	Membership At C. C.: 2625 P.O.Box 3928 Riyadh 11461 PHONE: 4778384 / 4778385 FAX: 4779793 E.mail: riadh@khatibalami.com Website: www.khatibalami.com

### Appendix D.3: Invitation of Company 3

Durrat  
**Al Maram** Est.  
Perfume & Cosmetics



مؤسسة درة  
**المرام**  
عطور وأدوات تجميل

10/03/2013

To whom it may concern

We writing in response to the request of Mr. AHMED ALTAYYAR (Passport No: K96887) for getting data and information from our company for the purpose of his PhD research. We would like to write here that we are willing to give him access to all necessary data he needs.

Best Wishes

Sulaiman Al-Hamad



ص.ب ١٤٣٧٥ الرياض ١١٤٢٤ - س.ت ١٠١٠١٢٩٦٥٢ اشتراك الغرفة التجارية ٦٤٥١١ - هاتف ٢٨٧٤٨٠٠ فاكس ٢٨٧٥٨٦١  
P. O. Box 14375 Riyadh 11424 - C. R. 1010129652 - C. C. 64511 - Tel. 2874800 Fax 2875861

## Appendix D.4: Invitation of Company 4

AMAZOON FRAGRANCES TRADING EST.



مؤسسة روائح الأمازون للتجارة

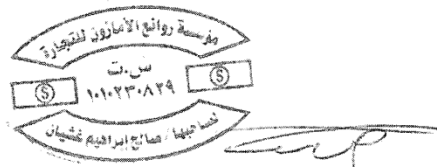
20/04/2014

To Whom It May Concern

I am writing to inform you that Mr. AHMED ALTAYYAR (Passport Number: K96887), doing his PhD research on e-procurement requested us for data collection. We confirm that we are willing to provide him with all the information he need and will co-operate to whatever extent we can.

Kind regards

Saleh bin Gishian







## Appendix D.6: Invitation of Company 6



## مؤسسة الاتحادات الدولية للتجارة International Unions For Trade Est. (IUT)

To Whom It May Concern

I am writing to inform you that Mr. AHMED ALTAYYAR (Passport Number: K96887), doing his PhD research on e-procurement, requested us for data collection. We confirm that we are willing to provide him with all the information he need and will co-operate to whatever extent we can.

Kind regards

General Manager  
Abdalziz Al Utaibi  
International Unions for Trading.



مؤسسة الاتحادات الدولية للتجارة



الرياض - الدائري الشرقي بين مخرج (10 - 11) - ت : ٤٤٥٥٦٩٥ ١١ ٩٦٦ + - ص.ب ١٠٥٨٧١ - الرمز البريدي ١١٦٥٦  
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**Appendix E.1: AHP Questionnaire**

**1- What is the most important factors would have affect to your company to e-procurement adoption?**

Please use the scale provided.

	CR	BE	BR	CSFs	OFP
CR					
BE					
BR					
CSFs					
OFP					

<b>Scale</b>	<b>9</b>	<i>Absolutely more important</i>	<b>1</b>	<i>Equally important</i>
	<b>7</b>	<i>Demonstrated more important</i>	<b>1/3</b>	<i>Clearly less important</i>
	<b>5</b>	<i>Essentially more important</i>	<b>1/5</b>	<i>Essentially less important</i>
	<b>3</b>	<i>Considerably more important</i>	<b>1/7</b>	<i>Demonstrated less important</i>
	<b>1</b>	<i>Equally important</i>	<b>1/9</b>	<i>Absolutely less important</i>

Attribute	Code
<i>Current Status and Readiness</i>	CR
<i>Perceived Benefits</i>	BE
<i>Perceived Barriers</i>	BR
<i>Critical Success Factors</i>	CSFs
<i>Perceived Future Organizational Performance</i>	OFP

**2- What is the most important role play with Current status and readiness of SMEs for e-procurement?**

	UIBA	BHW	SIWP	IOIP	ECIP	TUFP
UIBA						
BHW						
SIWP						
IOIP						
ECIP						
TUFP						

<b>Scale</b>	<b>9</b>	<i>Absolutely more important</i>	<b>1</b>	<i>Equally important</i>
	<b>7</b>	<i>Demonstrated more important</i>	<b>1/3</b>	<i>Clearly less important</i>
	<b>5</b>	<i>Essentially more important</i>	<b>1/5</b>	<i>Essentially less important</i>
	<b>3</b>	<i>Considerably more important</i>	<b>1/7</b>	<i>Demonstrated less important</i>
	<b>1</b>	<i>Equally important</i>	<b>1/9</b>	<i>Absolutely less important</i>

Attribute	Code
<i>Using the Internet regularly in business activities</i>	UIBA
<i>Business have a Website</i>	BHW
<i>Sort of information does website provide</i>	SIWP
<i>Important of internet in procurement process</i>	IOIP
<i>Employees in Company are involved in Procurement</i>	ECIP
<i>Technology mostly use for e-procurement</i>	TUFP

**3- What is the most important benefit that an organisation can get from the adoption of e-procurement?**

Please use the scale provided.

	BUS	EI	HIS	IEM	IRS	ICSL	ICS	IMS	RIL	RNC B	RPT	SEI
BUS												
EI												
HIS												
IEM												
IRS												
ICSL												
ICS												
IMS												
RIL												
RNC B												
RPT												
SEI												

<b>Scale</b>	<b>9</b>	<i>Absolutely more important</i>	<b>1</b>	<i>Equally important</i>
	<b>7</b>	<i>Demonstrated more important</i>	<b>1/3</b>	<i>Clearly less important</i>
	<b>5</b>	<i>Essentially more important</i>	<b>1/5</b>	<i>Essentially less important</i>
	<b>3</b>	<i>Considerably more important</i>	<b>1/7</b>	<i>Demonstrated less important</i>
	<b>1</b>	<i>Equally important</i>	<b>1/9</b>	<i>Absolutely less important</i>

<b>Attribute</b>	<b>Code</b>
<i>Better utilization of staff</i>	<i>BUS</i>
<i>Efficiencies increment</i>	<i>EI</i>
<i>Help to improve SCM</i>	<i>HIS</i>
<i>Improved existing markets</i>	<i>IEM</i>
<i>Improved relationships with suppliers</i>	<i>IRS</i>
<i>Increased customer service levels</i>	<i>ICSL</i>
<i>Increased customer satisfaction</i>	<i>ICS</i>
<i>Increases market share</i>	<i>IMS</i>
<i>Reduction in inventory levels</i>	<i>RIL</i>
<i>Reduction in non-contractual buying</i>	<i>RNCB</i>
<i>Reduction in operational tasks</i>	<i>RPT</i>
<i>Reduction in processing time</i>	<i>RPT</i>
<i>Support environmental issues</i>	<i>SEI</i>

#### 4- What are the biggest barriers to E-procurement implementation?

Please use the scale provided.

	LKS	LIL	TMALR	LOT	LFR	LISFG	FCINS	IOT	IWES	IFS	SC	COI
LKS												
LIL												
TMALR												
LOT												
LFR												
LISFG												
FCINS												
IOT												
IWES												
IFS												
SC												
COI												

<b>Scale</b>	<b>9</b>	<i>Absolutely more important</i>	<b>1</b>	<i>Equally important</i>
	<b>7</b>	<i>Demonstrated more important</i>	<b>1/3</b>	<i>Clearly less important</i>
	<b>5</b>	<i>Essentially more important</i>	<b>1/5</b>	<i>Essentially less important</i>
	<b>3</b>	<i>Considerably more important</i>	<b>1/7</b>	<i>Demonstrated less important</i>
	<b>1</b>	<i>Equally important</i>	<b>1/9</b>	<i>Absolutely less important</i>

Attribute	Code
<i>Lack of knowledge and skills</i>	LKS
<i>Lack of appropriate infrastructure and legislation</i>	LIL
<i>Top Management attitude and lack of resources</i>	TMALR
<i>Lack of trust</i>	LOT
<i>Lack of financial resources</i>	LFR
<i>Lack of interest or support from Government</i>	LISFG
<i>Fear to change into a new system</i>	FCINS
<i>Immaturity of technology</i>	IOT
<i>Incompatibility with ERP systems</i>	IWES
<i>Insufficient financial support</i>	IFS
<i>Security concerns</i>	SC
<i>cost of implement</i>	COI

**5- What are the most important critical success factors for implementing e-procurement**

	IISQ	FAPO	CIS	TS	OPR	UIAS	IONE	ET	CSPM	FS	CCMEI	CBP	CAIP	CABOS	CCWS
IISQ															
FAPO															
CIS															
TS															
OPR															
UIAS															
IONE															
ET															
CSPM															
FS															
CCMEI															
CBP															
CAIP															
CABOS															
CCWS															

<b>Scale</b>	<b>9</b>	<i>Absolutely more important</i>	<b>1</b>	<i>Equally important</i>
	<b>7</b>	<i>Demonstrated more important</i>	<b>1/3</b>	<i>Clearly less important</i>
	<b>5</b>	<i>Essentially more important</i>	<b>1/5</b>	<i>Essentially less important</i>
	<b>3</b>	<i>Considerably more important</i>	<b>1/7</b>	<i>Demonstrated less important</i>
	<b>1</b>	<i>Equally important</i>	<b>1/9</b>	<i>Absolutely less important</i>

Attribute	Code
<i>Improvement in internal service quality</i>	IISQ
<i>Fulfil administrative and political needs of an organisation</i>	FAPO
<i>A comprehensive strategy</i>	CS
<i>Technology standards</i>	TS
<i>organisations process re-engineering</i>	OPR
<i>User interface, Authentication and security</i>	UIAS
<i>Integration of the new e-procurement system with current technological standards</i>	IONE
<i>Education and training</i>	ET
<i>Consent of stakeholders and performance measurement</i>	CSPM
<i>Firm's size</i>	FSC
<i>Centralized control and management of E-procurement initiatives</i>	CCMEI
<i>Communication between participants</i>	CBP
<i>Clear and achievable implementation phase</i>	CAIP
<i>Clear accountability for buying in organizational structure</i>	CABOS
<i>Close collaboration with suppliers</i>	CCWS



**6- What would be the biggest impact of e-procurement on your organisation if implemented?**

Please use the scale provided.

	<b>IPTSPR</b>	<b>ELSI</b>	<b>SOP</b>	<b>LOP</b>	<b>IPO</b>	<b>OC</b>	<b>ORIEA</b>
<b>IPTSPR</b>							
<b>ELSI</b>							
<b>SOP</b>							
<b>LOP</b>							
<b>IPO</b>							
<b>OC</b>							
<b>ORIEA</b>							

<b>Scale</b>	<b>9</b>	<i>Absolutely more important</i>	<b>1</b>	<i>Equally important</i>
	<b>7</b>	<i>Demonstrated more important</i>	<b>1/3</b>	<i>Clearly less important</i>
	<b>5</b>	<i>Essentially more important</i>	<b>1/5</b>	<i>Essentially less important</i>
	<b>3</b>	<i>Considerably more important</i>	<b>1/7</b>	<i>Demonstrated less important</i>
	<b>1</b>	<i>Equally important</i>	<b>1/9</b>	<i>Absolutely less important</i>

<b>Attribute</b>	<b>Code</b>
<i>improve performance in terms streamlining performance and reducing cost</i>	<b>IPTSPR</b>
<i>E-procurement leads to sharing of information</i>	<b>ELSI</b>
<i>Short-term organizational performance</i>	<b>SOP</b>
<i>Long-term organizational performance</i>	<b>LOP</b>
<i>Improve cost performance in organization</i>	<b>IPO</b>
<i>Organizational competitiveness</i>	<b>OC</b>
<i>Organization's revenue increases after E-procurement adoption</i>	<b>ORIEA</b>

## Appendix F.2: Priorities of AHP

**Appendix G.1: Semi-structured - Interview**

**Semi-structured -Interview**

**Section I: General Information:**

- I. *Name:*
- II. *Age:*
- III. *Company:*
- IV. *Position:*
- V. *Education level :*
- VI. *Experience :*

**Section II: Specific questions:**

**Question 1**

Which model of E-commerce do you use for E-procurement in your company? And why?

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**Question 2**

For which activities have you been using the e-procurement system?

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**Question 3**

Which IT equipments and technology do you use for e-procurement?

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**Question 4**

Do you think you have enough IT qualified staff to adopt e-procurement in your organisation?

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**Question 5**

What other element or factors are important for the adoption of e-procurement in your SMEs in addition to the 5 element of GN Model (CS, CSF, BF, BR, FOP)?

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**Question 6**

What in your opinion are the likely benefits of e-procurement?

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**Question 7**

What are the likely barriers for e-procurement adoption in your organisation?

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**Question 8**

What do you think are the critical factors that can facilitate smooth adoption of e-procurement from your organisational perspective?

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**Question 9**

Do you think e-procurement can improve the performance of your organisation in future?

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**Question 10**

Any further information?

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