

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
KUMASI**

COLLEGE OF ARCHITECTURE AND PLANNING

**A FRAMEWORK FOR ADOPTING ELECTRONIC PROCUREMENT
(E-PROCUREMENT) IN GOVERNMENT HOSPITALS, KUMASI.**

BY

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**A THESIS PRESENTED TO THE BUILDING TECHNOLOGY
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DECLARATION

I hereby declare that this work is my own work towards the Master of Science degree and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

To the entire family, my wife and the children, Benewaa and Serwaa

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The project on e-Procurement frameworks for an organizational adoption has not been an easy task. It could not have been possible without the support and guidance of several people including my lecturers, classmates and family. Therefore I would like to take this time to thank everybody who has helped me create this body of work. First, none of this could have happened without the help of my primary advisor Dr Gabriel Nani. Secondly, I fully appreciate all that Mr. Ernest Kissi has done for me, throughout the organization of content in the study. Special thanks must be given to my friend Michael K. Mensah for helping me generate a work far greater than I could have imagined. Victor Boateng helped me out in a time of need, and I will never forget what he has done for me. Finally, my appreciation goes to the College of Architecture and Planning, KNUST for awarding me the degree of Master of Science in Procurement Management.

ABSTRACT

Public procurement can be described as the process by which large amounts of public funds are utilized by public entities to purchase goods, works and services from the private sector. The incorporation of Information Technologies (IT) and the internet to Government Procurement is called Electronic Public Procurement. E-Procurement is a deriving benefit attained from technological enhancements rather than using traditional paper based method in procurement operations. The main purpose of the study is to develop a framework on e-Procurement solution for the government hospitals in Kumasi to adopt and practice. Qualitative research approach was used to achieve the following specific purposes; the determination of the current procurement practices of the public hospitals, the identification of the structures that may be required to support e-Procurement adoption and the development of framework on e-Procurement to be adopted by Kumasi Government Hospitals. The study involved data from other studies after studying journals and other electronic papers. Data was wholly collected and analyzed for these outcomes; traditional paper- based procurement is the current practice of the government hospitals under study, the computer and internet systems have been known to be the major vehicle that drives e-Procurement and it is usually supported by an integrated suite software which is also known as the Enterprise Resource Planning (ERP), and a framework to guide e-Procurement adoption in government hospitals was finally developed. The study recommended IT training for the procurement practitioners at the government hospitals and suggested that public policy should cover the legal framework on e-Procurement system to ensure safeguard for both the buyer and the supplier. Finally, there should be further studies on public e-Procurement processes for the government hospitals and an online pharmacy.

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LIST OF ABBREVIATIONS AND ACRONYMS

TED	Tender Electronic Daily
KATH	Komfo Anokye Teaching Hospital
USA	United States of America
UK	United Kingdom
PPA	Public Procurement Authority
SCM	Supply Chain Management
SCMU	Supply Chain Management Unit
IT	Information Technology
ICT	Information and Communication Technology
UN	United Nations
UNICITRAL	United Nations Commission for International Trade Law
GP	Government Procurement
EC	European Commission
EU	European Union
HTTP	Hypertext Transfer Protocol
ERP	Enterprise Resource Planning
FTP	File Transfer Protocol
MRO	Maintenance, Repair and Operation
RFx	Request for Information, Proposal and Quotation
e-RFx	Electronic Request for Information, Proposal and Quotation
e-Procurement	Electronic Procurement
e-Government	Electronic Government
e-GP	Electronic Government Procurement
B2B	Business to Business

KEYWORDS AND MEANINGS

Adoption: The act of deciding to use a particular plan, method, or system.

Awareness: Knowledge or understanding of a particular subject or situation.

Contractor: a person or company that makes an agreement to do work or provide goods in large amounts for another company.

E-Commerce: A system of transaction in business done through electronic means.

E-Government: The system of government that uses the information technology in its management.

Framework: Principles, policies and rules governing a system to be adopted.

Government: The group of people who manages or governs a country or state.

Hospital: A large building or place where sick or injured people are looked after and receive medical treatment.

Infrastructure: The basic systems and structures that organization needs in order to work properly.

Model: A way of doing something that is successful or useful and therefore worth copying.

Pharmacy: A department in a hospital which is in charge of medical and surgical products.

Procurement: an official means of acquiring goods, works and services from eligible suppliers in a competitive manner.

Software: A set of programs that can be put into a computer when it will be needed for a particular function.

Supplier: A company that provides particular products that is needed for an organization or another company.

Supply chain: The system of people and things that are involved in getting a product from the place where it is made to the user.

Sustainable: An action or process that can continue or last for a long time.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Recent years have seen improvements in the internet and the ability of individuals to make purchases online. Because of these improvements many companies have looked to the internet to improve their supply chain management (SCM). Increasing the use of e-Procurement is of strategic importance for achieving the smart and sustainable growth objective of the European Union (EU) 2020 strategy (Peris et al, 2013). EU has been working hard for the adoption of e-Procurement in the governments of member states; overall action plans for the development of electronic Government (e-Government) occurred during the new millenium (Beauvallet et al 2011). In what could be seen as the future of procurement globally, the European Commission (EC) has set the deadline for all public sector buyers to carry out procurement electronically by 2016 (PPA, 2012).

The electronic procurement (e-Procurement) system is an internet- based advanced mechanism electronically with the suppliers of goods, works and services as per the rules and regulations applicable to public tendering systems and practices (Brussels, 2012). E-Procurement is more than just a system for making purchases directly with suppliers while managing all interactions between them. This includes management of correspondence, bids questions and answers, previous pricing and multiple e-mails sent to multiple participants (Rajkumar, 2001). The e-Procurement system supports companies to register online to qualify for participating in the tenders offered by different government entities.

According to Bof and Previtali (2007), twenty years ago, Malone, Yates and Benjamin formulated the Electronic Markets Hypothesis (EMH). They forecasted that network technologies would change markets, a theory that has been the subject of great debate ever since. The EMH predicted that electronic markets would become the favored mechanisms for coordinating material and information communication for technologies. According to them such technologies would create an electronic communication effects, which in turn, would lower communication, costs, enable the electronic aggregation of demand and supply information as a result, enhance the ability of firms to more closely coordinate their economic activities. Since their initial forecasts, it has become much quicker and convenient for buyer to screen suppliers and product offers using the electronic communication and information sharing capabilities of the world wide web (www) that we still use.

Ageshin's 2001 study (cited in Vaidya et al, 2006) shows that e-Procurement increased in the second half of 1999, when online auctions and product catalogs became common place on the internet and continued to expand. The convenience online buying offered, even in its infancy, led e-Procurement to reach as high in transactions in 1999. This study concluded that eighty-five percent of firms that made use of e-Procurement systems were highly satisfied with its benefits.

A good e-Procurement system helps a firm to organise its interactions with its crucial suppliers. It provides those who use it with a set of built-in monitoring tools to help control costs and assure maximum supplier performance. It provides an organised way to keep an open line of communication with potential suppliers during a business process. The system allows managers to confirm pricing, and leverage previous agreement to assure each new price quote is more competitive than the last (Peris et al, 2013).

Public procurement is an important function of government which has to satisfy requirements for goods, works and services in a timely manner. Furthermore, it has to meet the basic principles of good governance: transparency, integrity and value for money (Vaidya et al, 2006). However, working with a supply chain that offers the lowest cost with the environmental sustainability service is vital for public/government agencies like hospitals. While the supply chain management (SCM) is interested in improving quality, it looks to cut costs wherever possible. Doctors, nurses and other end users of the supplies look to use the best products as soon as possible. The SCM stakeholders of the government hospitals must delicately balance the wishes of both the hospital management and end users. The Supply Chain Management Unit (SCMU) of the government hospitals was established as part of the hospital management's strategy of achieving value for money, economy transparency in the use of public funds, ensuring continuous availability of goods and services, and enhancing the operations of the hospital healthcare delivery (PPA, 2012).

The SCMU's main objective is to bring together the efficient and effective operation of procurement, monitoring and evaluation, stores, inventory control, and contract management activities under one unit to ensure effective management. The rationale is to improve co-ordination in the various interfaces to reduce unnecessary cost, stock-outs, etc to the lowest level possible, while ensuring continuous availability of goods and services to support quality healthcare delivery. The centralised SCMU is responsible for procurement of goods including drugs, general services like sanitation, technical services and assist in the procurement of works and consultancy. According to a 2012 procurement digest (monitoring and evaluation) conducted by the PPA, Ghana (PPA, 2012).

In order to sustain the procurement environment from traditional methods of vendor/buyer interactions which is paper based, many organizations are using a strategic sourcing software to enable them actually negotiate with a larger number of suppliers easily (Beauvallet et al, 2011). According to Mettler and Rohner (2009), the prerequisites for understanding the adoption and diffusion of the automated procurement systems in government hospitals are the study of the activities and organizational structures of the entities responsible for the procurement in public hospitals.

1.2 PROBLEM STATEMENT

Traditionally, public procurement has involved a number of communication mediums to facilitate procurement process between the parties (buyers and suppliers). These have included the use of mail, phone, fax and more recently e-mails to suppliers. This paper-based is the major system adopted by the public hospitals (PPA, 2012).

There is increasing concern with sustainable development and impact of businesses on society and the environment. This indicates that government agencies are keen to demonstrate sustainability and corporate social responsibility and reduce impacts on the environment (Walker and Brammer, 2009).

Studies have identified that communicating and collaborating with suppliers electronically can aid environmental supply chain management, although such studies have tended to be conducted in manufacturing contexts (Sharfman et al, 2007). E-Procurement has been investigated in a public sector context; and in the public domain can be seen as the use of ICT to support delivery of public procurement policy transparency and efficiency (Carayannis and Popesan, 2005).

The greatest e-commerce potential will be realized when all transactions can be transmitted electronically from the buyer to the distributor and fully integrated into existing provider

systems. The inability of Kumasi government hospitals to integrate electronic information in their supply chain systems has been a great disadvantage and affecting value for money and sustainability. Eventhough these government hospitals have technological equipment in operations that are closely related with e-Procurement tools, they practice the paper-based transaction system of procurement due to inadequate knowledge on e-Procurement procedure which is very new to practice.

1.3 AIM

The purpose of the study is to develop a framework for adopting e-Procurement by government hospitals in Kumasi.

1.4 RESEARCH OBJECTIVES

- To determine the current procurement practices of Kumasi Government Hospitals.
- To identify structures that may be required to support e-Procurement.
- To develop a framework for adoption of effective e-Procurement practices by Kumasi Government Hospitals.

1.5 RESEARCH METHOD

The study adopted a descriptive research approach and qualitative data collection and analysis to develop a framework on e-Procurement for the government hospitals to adopt and implement towards an effective practice. It also involved a systematic and critical review of journal articles and reviewed books that contain reliable data to support the subject under study. Data was collected from procurement practitioners of the study area by answering open-ended questions and studies of related journals and books on e-Procurement and

analyzed by comparing theories developed by several authors. Twenty- two articles were totally involved in this study.

1.6 LIMITATIONS

Research normally goes with limitations. The study faced the problem of financial constraints since the hospitals are not closer to each other. There had to be moving to and fro the various hospitals. Delays in responding to questionnaires by respondents were also another problem faced. This was because they are busy officials running the procurement activities of the hospitals. These were however tackled with continuous phone calls and reminder messages to the SCMUs of the selected hospitals.

CHAPTER TWO

REVIEW OF LITERATURE ON E-PROCUREMENT PRACTICES

2.1 INTRODUCTION

In this chapter, several studies about the adoption of e-Procurement in organizations were reviewed. This chapter focuses on a framework for the adoption of the e-Procurement in the government hospitals. The current procurement practices of these hospitals would be determined after the review of related literature on e-Procurement definitions, concepts of other studies conducted with respect to the PPA, 2012 report on monitoring and evaluation. The chapter seeks to review structures that may support e-Procurement functions in the supply chain managements of e-Government hospitals. It also reviewed the general e-Procurement from other studies. This study involved a thorough search of materials through various sources of journals articles, published conference reports, and reviewed books.

2.2 AN OVERVIEW OF E-PROCUREMENT

Buyer software enables users to automate transactions and focus on the buying organization's activities, such as order placement, catalog management, payment, reporting, and so on. Most of these systems currently handle maintenance, repair and operating (MRO) products (Rajkumar, 2001). According to Gebaner and Shaw (2004) Users typically access the client software on their desktop, providing access to e-catalogs that are customized for their organization. Users typically source from preferred suppliers listed on their catalogs, within limits enforced by purchasing management. If the purchaser of an item does not have the authority to buy it, these systems route the document to appropriate channels and manage the workflow (Rajkumar, 2001). The purchasing limits and approval routings are stored as profiles for users within the system. Systems such as Ariba, Oracle, Lawson and

CommerceOne typically fall in this category. Such systems can be integrated with back-end ERP and database systems. In such cases these systems will perform general ledger updates, payment, and so on (Assar et al, 2006). E-Procurement systems generally must be capable of integrating multiple supplier catalogs into an aggregated, buyer-managed view of the catalog. They enable review of product purchase patterns and deliver knowledge that can be used to facilitate supplier negotiations (Khanapuri et al, 2011). These systems enable purchasing to automate most of the transaction processing, as well as to reduce cycle times, limit reductions in off- catalog buying, and free purchasing to focus more on activities such as strategic sourcing. However, these systems have their own draw- backs (Peris et al, 2013). According to Puschmann and Alt (2005) they are fairly costly (as much as a few million dollars) to implement, and it is cumbersome to maintain catalogs. Still, many companies choose to implement them since they give purchasing the opportunity to reengineer the buy process for MRO items. Similar to buying organizations having e-Procurement software, suppliers need software on the sell side that can cater to these buyer systems or exchange information with marketplaces. For example, the sell-side systems need to provide information in the format needed by the buy system catalogs (Assar and Boughzala, 2008)

2.3 DEFINITIONS OF E-PROCUREMENT

Smart (2010) defines e-Procurement as an application hosted by the buying firm to allow users to search for products, place and track orders, receive and pay for purchases. Uses catalogues provided by suppliers or draws product data from supplier sites through punch-out (retrieving data from web sites). An electronic or automated procurement technology is also defined as any technology designed to facilitate the acquisition of goods by a commercial or a government organization over the Internet (Palmer et al, 2002). E-Procurement is defined as an internet-enabled purchasing of goods, works and services by one buyer from many

suppliers (Andries, 2006). E Procurement is the new paradigm in procurement which acts as information hub to support business planning and decision making, which improves performance of routine tasks like transaction processing, monitoring and enforcement of regulatory compliance (Khanapuri et al, 2011). According to Brussels (2012), electronic procurement (e-Procurement) refers to the use of electronic communication by public sector organizations when buying supplies and services or tendering public works. E-Procurement is the electronic management of all procurement activities, that is the use of web communications to facilitate purchasing processes and strategy, and is part of the broad e-commerce revolution (Mozeik, 2004)

2.4 PUBLIC E-PROCUREMENT CONCEPTS

For firms, e-Procurement means the integration of technological tools into purchasing activities taking place within supply chains while performing their operations (Bof and Previtali, 2007). In other words, e-Procurement is a deriving benefit attained from technological enhancements rather than using traditional a paper based method in procurement operations. In a more detailed explanation, e-Procurement gains the advantage of electronic commerce (e-commerce) to determine potential supply alternatives, to purchase goods and services, to transfer the prices of these goods and services and to interact with suppliers (Angeles and Nath, 2007). As e-commerce develops in the business world, the purchase process is speeded up between supply chain members, the fund transfer is simplified, supplier bases expand, paperwork for transactions is reduced and possible order errors are eliminated (Min and Galle, 2003)

The concepts of automated e-Procurement, or electronic B2B (business-to-business) trade, are grounded in the strategic leveraging of both tangible/intangible assets for successful implementation and execution of electronic trade, resulting in significant financial benefits

for firms. Some of the major reasons for this growth include significant process savings from automation, compliance, and purchasing advantage; and reduced costs that organizations can experience by conducting transactions electronically (Smith and Flanegin, 2004). According to Bof and Previtali (2007) today, the backlash against e-Procurement is gone. Leading enterprises have learned a lot of lessons from their early e-Procurement deployments, and best-in-class performers have intelligently expanded their e-Procurement implementations and are gaining benefits that create a competitive edge in the marketplace. Participants in Aberdeen benchmark research conducted in 2004 showed that e-procurement produces cost reductions, higher productivity, and increased spend under management. Simply put, e-Procurement is consistently delivering significant benefits to enterprises. Benchmark survey respondents reported improved compliance; reductions in off-contract (“maverick”) spending, reductions in requisition-to-order cycles and costs, and percentage of total enterprise spend under management of procurement. (Aberdeen, 2005)

Although online purchasing is a significant issue for real firms operating within different sectors, researchers have not given much attention to this area (Ronchi et al., 2010). The study of Zheng et al., (2006) conducted in a UK health sector investigates the supply chains of the following products: orthopedic footwear, cardiac stents, intravenous fluids and blood tubes.

Although the concept of e-Procurement has been widely implemented in the US and European markets, the emerging economies are still lagging in this aspect. Nevertheless, the Indian government is promoting e-Procurement as part of its ‘caring’ governance initiative. For instance, through the online portal of e-Procurement is a comprehensive e-infrastructure that will fuel growth by means of profitable B2B e-commerce (Khanapuri et al, 2011)

Online procurement (e-Procurement) has been identified as the most important element of e-business operational excellence for large corporations in Palmer et al (2002) study. The Communication also announces that the European Commission itself will move towards full e-procurement by mid-2015 – a full year ahead of the deadline for Member States – and that the Commission will make its e-Procurement solutions available to Member States (European Commission, 2012). A well designed process and policy willing can be essential pre-conditions for e-Procurement implementation (Beauvallet et al, 2011). However, there is a crucial variable which put at risk the success of the implementation. This variable tends to be users' acceptance of the new process (Smith, 2003). E-Procurement consists of change for the organization and specifically for the employees of the procurement unit. Abolition or reduction of the traditional handwritten procedure and its replacement of new procedures based on the use of computer and information technology may consist of some of the major changes (Pasiopoulos et al, 2013).

E-Procurement is a comprehensive e-infrastructure that will help the government and the citizens realize the vision of fuelling growth via profitable B2B e-Commerce, providing a robust, proven platform used by the largest companies in the world. It enables trade between companies of different sizes, platforms and locations.

The results of this study show that although e-mails and auto-faxes are used in procurement activities among supply chain members, the telephone ordering seems a dominant practice for communicating with suppliers. As they have not made many changes to their procedures, public buyers have not seen the gains that they imagined would result automatically from e-Procurement in terms of cost savings, simplicity, transparency, and the like. The e-Procurement therefore covers all the process involved in the product acquisition (procurement) of a specific organization such as design, source, evaluate and buy.

2.5 STRUCTURES REQUIRED TO SUPPORT E-PROCUREMENT

According to Thomson (2006) both stationary and mobile computers are suitable for buyer-supplier interactions. Integrated suite software that enables e-Procurement operations is developed to suit both stationary and mobile device users. According to Bidgoli and Hossein (2004), for entities to adopt the e-Procurement system, they should have in place, the following Hardware: Personal Computer, Broadband Internet Connection, Scanner & Printer and Card Reader (Installation). These software must also be available: an operating system, Microsoft Office or equivalent, PDF Writer/PDF reader, Anti-Virus Software, Java and Internet access software.

2.5.1 Public E-Procurement System

An e-Procurement system manages tenders through a web site (Min and Galle, 2003). This can be accessed anywhere globally and has greatly improved the accessibility of tenders. Studies have demonstrated that employees' training is a crucial factor for perception of ease of use and acceptance of information technology. The lack of system knowledge may create anxiety, negative attitude and diffusion to use e-Procurement technology. Training programs provide knowledge and primarily experience of computers and new information technology, making employees more confident (Panayiotou et al, 2004). According to studies findings on e-Procurement systems, perception about electronic procurements' ease of use was significantly associated with those that reported ease of internet use. This finding is consistent with findings of other studies, where individuals' computer self-efficacy and system experience had a significantly positive effect on perceived ease of use of the internet system (Pasiopoulos et al, 2013). The Internet represents an insecure channel for exchanging information leading to a high risk of intrusion or fraud, such as phishing (Gralla, 2007 and Bichler, 2000).

The Internet consists primarily of the collection of billions of interconnected web pages that are transferred using HTTP (Hypertext Transfer Protocol), are collectively known as the World Wide Web. The Internet also uses FTP (File Transfer Protocol) to transfer files, and SMTP (Simple Mail Transfer Protocol) to transfer e-mails (Gralla, 2007).

An inadequate e-Procurement system can also impede workflow by being too device-dependent. If workflow moves only through stationary computers, mobile users will not have the opportunity to complete their tasks until they sit down at the location of the stationary computer. Business agility demands efficient workflow and prompt responses to requisitions and requests for approval. Staying ahead of the game depends on empowering employees wherever they happen to be (Flanegin, 2006). Most suppliers perceive participation in an e-Procurement system as a cost of doing business, rather than as value added to their materials or services. Integrating the value chain with customers has up-front and ongoing administrative costs, such as the cost of updating the attributes of items and services. They also need to invest in assuring the security of their own IT systems even as they integrate them with others' down the value chain (Gralla, 2007). In a rapidly evolving business, an e-Procurement system must be able to adopt as procurement policies and processes change. Systems that are not extensible and flexible enough to model any aspect of the procurement process shopping, oversight and analysis, or supplier management will be inconvenient to use and suffer poor adoption rates. Even systems that are flexible and extensible can be costly to maintain and degrade business agility if they routinely require IT expertise to change contract, payment, and shipping terms (Rajkumar, 2001). Web sites that bring multiple buyers and sellers together in one central virtual market space and enable them to buy and sell from each other at a dynamic price that is determined in accordance with the rules of the exchanges (Smith, 2003).

2.5.2 Public E-Procurement Software

According to Bidgoli and Hossein, (2004) cited in Thomson (2006) study, Enterprise Resource Planning (ERP) is a cross-functional enterprise system driven by an integrated suite of software modules that supports the basic internal business processes of a company. ERP gives a company an integrated real-time view of its core business processes such as production, order processing, and inventory management, tied together by ERP applications software and a common database maintained by a database management system. ERP systems track business resources (such as cash, raw materials, and production capacity) and the status of commitments made by the business (such as customer orders, purchase orders, and employee payroll), no matter which department (manufacturing, purchasing, sales, accounting, and so on) has entered the data into the system. ERP facilitates information flow between all business functions inside the organization, and manages connections to outside stakeholders (Adam et al, 2011).

Enterprise system software is a multi-billion dollar industry that produces components that support a variety of business functions. IT investments have become the largest category of capital expenditure in United States-based businesses over the past decade. Enterprise systems are complex software packages that offer the potential of integrating data and processes across functions in an enterprise. Although the initial ERP systems focused on large enterprises, there has been a shift towards smaller enterprises also using ERP systems (Thomson, 2006). Organizations consider the ERP system a vital organizational tool because it integrates varied organizational systems and enables flawless transactions and production. However, an ERP system is radically different from traditional systems development. ERP systems can run on a variety of computer hardware and network configurations, typically employing a database as a repository for information (Gill, 2011).

In 1990 Gartner Group first employed the acronym ERP as an extension of material requirements planning (MRP), later manufacturing resource planning and computer-integrated manufacturing according to Bidgoli and Hossein (2004). Without supplanting these terms, ERP came to represent a larger whole, reflecting the evolution of application integration beyond manufacturing. Not all ERP packages were developed from a manufacturing core. Vendors variously began with accounting, maintenance, and human resources. By the mid-1990s ERP systems addressed all core functions of an enterprise. Beyond corporations, governments and non-profit organizations also began to use ERP system (Walsh, 2009). According to Turban (2008), entities perceive ERP as a vital tool for organizational competition, as it integrates dispersed organizational systems and enables flawless transactions and production. ERP vendors traditionally offered a single ERP system. ERP systems suffered from limitations in coping with integration challenges dealing with changing requirements. However, companies preferred to implement an ERP suite from one vendor that incorporated stand-alone point solutions (that once filled feature gaps in older ERP releases) to achieve higher levels of integration and improve customer relationships and the supply chain's overall efficiency.

However, Rajkumar (2001) study reveals that, though most companies still follow the single source approach, a significant number of firms employ a strategy of “best of breed” ERP to strive for a competitive advantage. ERP vendors began to acquire products, or develop new features comparable to or better than many of the top applications. According to Bendoly and Schoenherr (2005), these helped companies, via single source, maintain or create a competitive advantage based on unique business processes, rather than adopt the same business processes as their competitors. In the following years, integration was a leading investment due to a feature gap and the need to extend and integrate the ERP system to other enterprises or "best of breed" applications. Integration was ranked as one of the leading

investments for 2003. Well over 80% of U.S. companies budgeted for some type of integration in 2002, and roughly one-third of U.S. companies defined application integration as one of their top three IT investments in 2003. ERP license revenue remained steady as companies continued their efforts to broadly deploy core applications, and then add complementary features in later phases (King, 2005).

Developers now take greater effort to integrate mobile devices with the ERP system. ERP vendors are extending ERP to these devices, along with other business applications. Technical stakes of modern ERP concern integration hardware, applications, networking, supply chains. ERP now covers more functions and roles including decision making, stakeholders' relationships, standardization, transparency, globalization, etc (O'Brien, 2011).

2.6 STRATEGIES FOR E-PROCUREMENT ADOPTION

Over the years, e-Procurement systems have evolved to become an integral tool for the management of the procurement process for both the private and public sectors. Today, government entities are presented with a number of existing solutions and options to support the implementation of an e-Procurement solution. Each option presents different implementation considerations, including integration to existing practices and systems and the adoption of a solution across an entire organization (Laguado-Giraldo, 2005).

Experts provided significant input and discussion in relation to the development of guidelines for an e-Procurement. Guidelines should tie the basic tenets of e-Procurement - transparency, effectiveness, economic development with the key pillars and components of an e-Procurement system and should assist in the formulation of a strategic plan for the institutionalization of a procurement reform process and not just the implementation of an e-Procurement system (UN, 2011).

The purchasing function has undergone a transformation from being more of a clerical function to a managerial function, which has a strategic focus on improving the organizational competitive position of companies. IT has been a key enabler in purchasing evolution into a more strategic business function, by reducing the time taken to complete mundane tasks and allowing purchasing agents to focus on more value-added activities (Rajkumar, 2001).

The creation of documented and executable strategies prior to the deployment of the e-Procurement solution is an important Critical Success Factor (CSF) (Neef, 2001). This notion is further supported by the Operational Services Division Report findings that as the procurement strategy is intended to provide savings enabled by the technology, e-Procurement should be procurement-driven as well as technology-driven (OSD, 2001). Therefore, a clearly defined e-Procurement strategy not only emphasizes the importance of e-Procurement in the public sector but takes into consideration major institutional changes from the procurement process perspective as well as from the organizational perspective (World Bank, 2003). Another Department of Finance report noted that the e-Procurement strategy should be based on the introduction of sound procurement practices while taking into account the differences in requirements of the public and private sectors (DOF, 2001).

2.6.1 Guidelines on E-Procurement.

International guidelines have contributed to the determination of what the legal pillars of an Electronic Government Procurement (e-GP) legal framework contain. After a couple of years, two main pillars have been identified Rules about electronic disclosure of Government Procurement (GP) related information and Rules about legal validity of GP electronic documents. The most relevant contribution in this respect comes from the United Nations

Commission for International Trade Law's (hereon UNCITRAL) whose goal in this matter is to introduce GP into the Regulatory framework, including primary legislation such as laws or secondary legislation as decrees or presidential orders must be seen as the starting point of any GP system (UNCITRAL,2011).

According to European commission (2005), the Experts General Meeting examined various ICT options available and current trends with the implementation of e-Procurement systems and models applied, as well as the management approaches taken in support of the implementation, both from a legislative and policy perspective and from a technical perspective. Some of the questions for consideration included: a) How to design/reform e-Procurement systems within government agencies in terms of institutional arrangements, new skills, financial resources and operational support required to manage the system. This would entail:

- understanding and enhancing the role of e-Procurement in ensuring transparency, accountability and the delivery of services, including the need for demonstrated leadership with the implementation of the system;
- outlining and evaluating the operational context for e-Procurement approaches;
- outlining and evaluating ICT tools and frameworks to increase a country's ability to engage in e-Procurement policies and practices;
- evaluating methods for collaborating across government departments to achieve common outcomes;
- long-term planning and risk management for the on-going operation of the system, including required support resources and funding requirements. b) How to achieve efficiencies that reduce government costs while enhancing transparency of procedures. c)

How to address the issue of digital divide and how governments could use mobile technology to enhance e-Procurement possibilities. d) How to improve the integration of e-Procurement services of different government sectors which entails back-end coordination and interoperability issues, and how to practically assess back-end integration by reviewing the upfront services.

2.7. THEORETICAL FRAMEWORK

E-Procurement adoption poses a great many challenges for both public and private organizations (Kraemmer, 2003). One serious impediment to adoption is the lack of awareness of e-Procurement procedure and its implications for organizational performance. In this section, an attempt to develop a theoretical framework for the adoption of e-Procurement in the government hospitals had been laid emphasis on other studies. Vaidya et al, (2006), developed a conceptual framework (Fig.2.1) by surveying a number of specialized reports on e-Procurement initiatives in the UK, US, and Australian public sectors readily available to practitioners and decision-makers. The survey was a conceptual model showing a number of unique factors regarded as instrumental in the success of public sector e-Procurement adoption and implementation. For example, it was found that e-Procurement projects have a greater reach and scope than traditional IT development projects. Security and controls, and standards and interfaces emerged as more important requirements than those in other IT projects. Key differences in the approach to the development of e-Procurement projects were also noted during the study. Interestingly, the legal and legislative issues did not emerge as Critical Success Factors (CSFs), although factors such as top management support and performance measurement were found to be critical projects.

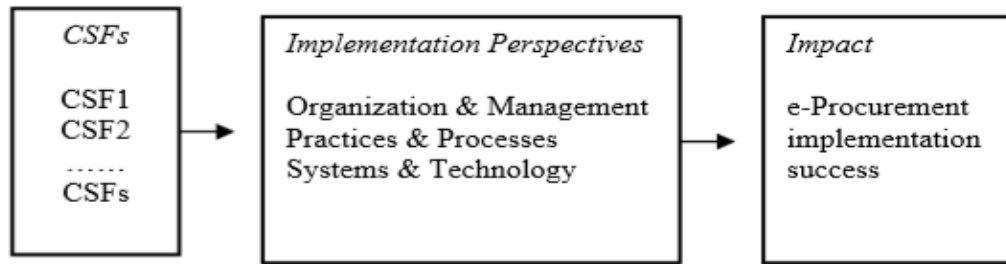


Figure 2.1: A framework on e-Procurement adoption and implementation success.
Source: Vaidya et al, (2006)

The framework (Fig. 2.2) was developed by Gunasekaran and Ngai (2008) on the basis of Vaidya et al, (2006) study and literature review on other e-Procurement adoption models in figure 2.1. The building blocks of e-Procurement adoption were: perceived benefits of e-Procurement, perceived barriers of e-Procurement, critical success factors of e-Procurement adoption, and perceived organizational performance with e-Procurement. The framework, as presented in Fig. 2.2, has been used to study the status of the adoption of e-Procurement in public organizations. The details of the framework were discussed below.

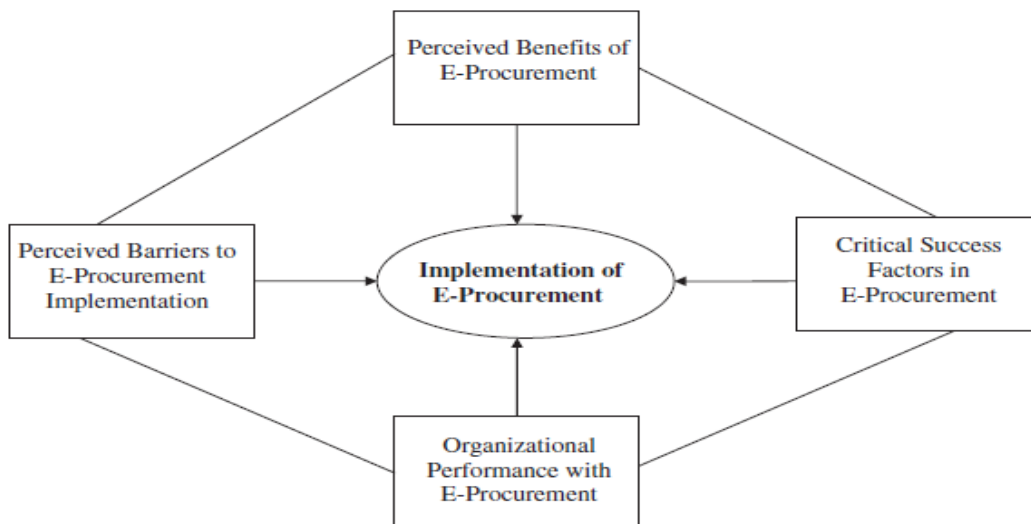


Figure 2.2. A framework for e-Procurement adoption and implementation.
Source: Gunasekaran and Ngai (2008)

2.7.1. Perceived benefits of e-Procurement

The perceived benefits of e-Procurement as seen by companies have tremendous implications whether one goes for the technology or not. In many cases, the real benefits including strategic impact, intangibles, and non-financial outcomes are not spelt out, resulting in companies not recognizing the true value of e-Procurement in the supply chain and in turn helping to provide the best possible customer service.

Peleg et al. (2002) study three possible strategies a company might choose to follow, namely strategic partnership, in which a company signs a long-term contract with a single supplier, so that future prices are known in advance; online search, in which the Internet is used for selecting the supplier with whom an order will be placed. Unit price in this case is assumed to be random, but its distribution is known in advance, and it is assumed to be a function of the number of suppliers contacted for a price quote; and a combined strategy, under which a supplier is used as a long term partner, but a second source might be chosen through the Internet (Peleg et al., 2002).

Attaran (2001) classifies e-Procurement benefits into three different categories: strategic, which concerns organizational changes and market advantage; opportunity, which is mainly related to improved and explored relations with present or even new suppliers; and operational, which means cheaper and more efficient purchasing processes. Roche (2001) emphasizes the benefits coming from immediate availability of information, paperless processes, and supply chain integration.

The adaptors of e-Procurement systems worldwide, such as Cisco, Chevron, and Eastman Chemicals, have demonstrated substantial improvements in several ways. The benefits of e-Procurement should include improved control of vendor relationships, accurate order fulfillment processes, improved effectiveness of the purchasing process, achievement of

higher service levels, reduced prices from the key suppliers, reduced inventory-carrying costs, and reduction of the order cycle (Panayiotou et al., 2004).

2.7.2. Perceived barriers to e-Procurement

The successful adoption of e-Procurement depends on the barriers present in the system. Identifying the barriers themselves is part of the major managerial function in developing the right pathway for the adoption of e-Procurement. The barriers could stem from infrastructure, strategy, people, culture, etc.

Liao et al. (2003) highlight the problems associated with procurement: untrue floor prices, improper alteration supplements, improper procedures in awarding contracts, information leaks, taking bribes and improper benefits for some favored companies, and careless supervision and resource distribution. Behavioral and political dimensions have a great influence in defining the procurement process and its effectiveness. In many cases, the communication has been distorted by the individuals to pursue their own interests in the organization. E-Procurement will facilitate shared information and hence open communication, and there will be fewer behavioral and political impacts.

Some of the perceived barriers one should include against adopting e-Procurement are insufficient resources, lack of motivation of people, resistance to new technology, lack of top management support, etc (Liao et al. 2003).

2.7.3. Critical success factors (CSFs) in e-procurement

The factors that are critical to the successful adoption of e-Procurement have to be identified based on previous experience, the literature available, seminars, etc., with the objective of determining the CSFs for the adoption of e-Procurement (Vaidya et al, 2006). This could be even defined as the best practices for the successful adoption of the e-Procurement system.

In e-Procurement systems, critical success factors should include efficient processes without excessive idle times, existence of monitoring and evaluation systems that permit the continuous improvement of the process, and adequate training of the employees in order to enable them take advantage of the new system (Panayiotou et al., 2004).

According to Kim and Shunk (2004), e-commerce is not something that can be instantly plugged into by an existing workplace, and implementing e-Procurement is not a simple matter. Its introduction will require changes, updates, replacements, and adaptations throughout the infrastructure.

Successful e-Procurement is more concerned with the fundamental procurement aspects than with the electronic aspects. Plans for new ways of doing business, particularly when expressed using technological jargon, are generally not well received. It may need changes in the way people work, as well as in the strategies of the organization (Vaidya et al, 2006).

2.7.4. Perceived organizational performance of e-Procurement

Optimum organizational performance is the key objective of any organization. Therefore, any change in the process or technology should have a positive impact on a company's performance. E-Procurement does have some implications for process improvement but more important is how this improvement, affects organizational performance in both financial and non-financial terms. E-Procurement has several advantages (Raghavan and Prabhu, 2004): reduced overall procurement costs compared with current traditional methods, shorter-order processing and fulfillment cycles, reduction in administrative costs, improved strategic sourcing, and reduced inventory costs.

Fu et al; (2004) present an implementation of an e-Procurement model. The following are the critical success factors in the successful implementation of e-commerce: feasible measures, step-by-step transformation, promotion incentives, and government support, commitment of

top management, and system operation and maintenance mechanisms. Once the strategy was clearly set up, the top management team took the lead in mapping out an implementation plan and a complete set of measures. The enterprise also provided sufficient incentives to suppliers and made good use of the external resources to promote the project.

2.8 SUMMARY OF THE LITERATURE REVIEW

Overview and clear definition of what e-Procurement is and how it is applied, including conceptual illustrations about the fact that e-Procurement is a business service provider and not just an ICT project simply means that e-Procurement automates through all the procurement process and not just a part. The fact that organization use the internet for cataloging maintains understanding the task is not just implementing an e-Procurement system but institutionalizing a procurement reform process; this study may also include considerations on system implementation over time, focusing on initial objectives and moving forward as they develop the business marketplace for the system.

The Aberdeen (2005) identifies transactional benefits derived from electronic commerce via the Internet. Rajkumar (2001) identifies both operational and strategic benefits to using electronic commerce for purchasing products. Many purchasing executives believe that the long-term benefit of e-Procurement will be the freeing of purchasing resources from transaction processing to refocus them on strategic sourcing activities.

In order to maintain efficient workflow of the procurement system, stationary and mobile computers have the opportunity to be used for e-Procurement operations (Flanegin, 2006, Bidgoli and Hossein, 2004). They also need to invest in assuring the security of their own IT systems even as they integrate them with others' down the value chain In a rapidly evolving business, an e-Procurement system must be able to adapt as procurement policies and

processes change. Systems those are not extensible and flexible enough to model any aspect of the procurement process. Not excluding the uninterrupted networking flow access of the internet broadband (Smith, 2003). The challenges both technical as well as security concerns, problems arising due to transition in the role of purchase personnel and inadequate governmental intervention for implementation of e-Procurement in health sector have been highlighted in the paper. Issues within the scope of organization can be taken care of by training and enhancement of IT skill sets. Similarly, internet security should be made stringent by monitoring mechanism and the legal framework on e-Commerce should be updated to meet the current IT requirements not forget an efficient software for e-Procurement running. From the literature, the public hospitals are required to have the enterprise integration suite software (ERP) before the e-Procurement adoption (Adam et al, 2011).

Various models from different studies were reviewed under e-Procurement strategies and guidelines gearing towards e-Procurement adoption and implementation. Critical success factor of e-Procurement adoption and implementation was the subject of the developed framework by Vaidya et al, (2006) which was later practiced by procurement experts and was considered as a model. Gunasekaran and Ngai (2008) later reviewed the critical success factors study and it was considered in their study. They also organized the models and theories in different studies and came out with the framework in Figure 2.1. Their study considered four specific factors. Those were; (a) perceived benefits of e-Procurement that included strategic impact, intangibles, and non-financial outcomes, (b) perceived barriers of e-Procurement dealt with elements like infrastructure, strategy, people, culture, (c) critical success factors of e-Procurement adoption was also based on previous experience, the literature available and seminars, and (d) perceived organizational performance with e-

Procurement was on how this improvement, affects organizational performance in both financial and non-financial terms.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

The methodology section is an important component of the research that essentially maps out the methods used during the research work. On the basis of research problem and objectives, this study used the descriptive and qualitative data. This chapter explains the methodology used to conduct this research. The chapter is concerned about how the data was collected and analyzed. It is organized in the following order; the introduction which is followed by the research approach adopted for the study, the research instrument, the data collection and the data analysis. On the basis of research subject and objectives, this study used the qualitative method of data analysis.

3.2 RESEARCH APPROACH

This study adopted a descriptive research design. A critical literature survey research approach is adopted to identify structures that may be required to support e-Procurement and to develop a framework on e-Procurement adoption for the public hospitals.

3.2.1 Sampling and Sampling Techniques

Purposively, the medical superintendents, procurement officers, pharmacists, store managers and contract administrators of the four government hospitals were considered in the investigation for data collection. The hospitals were Komfo Anokye Teaching Hospital, Tafo Government Hospital, Suntreso Government Hospital and Manhyia Government Hospital. Those professionals were considered as the research population because they are involved in the entity tender committee of the supply chain management and have much experience in the

current procurement practices of the government hospitals. The total population of these respondents is twenty (20). Five (5) persons were interviewed from each hospital. An authentic data was therefore obtained from a census sampling that amounts to size of twenty (20) which is to be analyzed for a reliable outcome.

3.3 RESEARCH INSTRUMENT

Questionnaire was used in place of scheduled interview to determine the current procurement practices and their existing structures to support e-Procurement currently at the four government hospitals. Both primary and probing questions that are open- ended were developed and used for the survey. A critical review was therefore conducted on e-Procurement adoption structures and frameworks. Then a general summary of the outcomes of all these epidemiological studies were provided at the end of this chapter, followed by discussion of the uncertainties introduced by various aspects of the study designs and data analysis and emerging recommendations for future studies in this area. It has to be noted that, in accordance with the objectives of this study, the summary of the studies outcomes is based on the conclusions made by the other related studies (from twenty- two papers) and the other investigations conducted.

3.4 DATA COLLECTION

Since the activities and information of the SCMUs are always confidential as one of the procurement ethics and as a right to privacy (especially to suppliers), formal registrations were made at the government hospitals under study before permissions were granted for the ultimate survey at their various departments and units. Data was therefore collected as part of the answers provided to the questionnaires and literature review was conducted to support the following purposes:

3.4.1 Determining the Current Procurement Practice of the Hospitals

The current procurement practices were determined based on how tenders are advertised and received by the four procurement entities (hospitals) and the medium of tender award notices to suppliers. Data was also gathered from definitions and conceptions on e-Procurement by studying the literature review already conducted. Comparison was therefore made to know the current procurement practices of the hospitals under study.

3.4.2 Identifying Structures required to Support E-Procurement.

Data was collected on the existing structures that may be required to support e-Procurement. Answers from the questionnaire as to know the hospitals' technological equipment (electronics) to support procurement activities were adequate instrument to determine the hospitals' ability to operate procurement electronically. Seven papers were used as a study tool on the public e-Procurement system. This was done by seeking reviews from the various studies as some writers gave different theories. Review was also done on the existing structures and system applications on automated procurement as implemented in the various government entities especially the public hospitals as well as the hardware and software that will suit the system. These were compared with what the hospitals have to enhance effective and efficient e-Procurement practices. The literature review conducted provided this study with more information on internet and intranet systems that serves as the backbone of this automated or electronic procurement practices which is the subject under study. Nine papers were studied on e-Procurement software. The literature on this software was done basically on the Enterprise Resource Planning (ERP).

3.4.3 Development of a Framework for E-Procurement Adoption.

Literature review was conducted on already developed models and concepts for public e-Procurement adoption by different studies. Nine theories and Vaidya et al, (2006) model on e-Procurement adoption were reviewed and converted into four building blocks, which were used to develop the theoretical framework. Critical review was therefore used to analyze the developed theoretical framework based on the study objectives and the literature review on e-Procurement systems and concepts to identify gaps (strengths and weaknesses) with regards to the study aim. Data collected from the current procurement system, existing structures of e-Procurement at the government hospitals and the literature review conducted in chapter two provided theoretical framework that was then used to form building blocks for the framework development.

3.5 DATA ANALYSIS METHOD

The study used a statistical approach to analyze the collected data from the questionnaire. Frequency tables and charts were displayed to give a pictorial view of what was gathered on the field before analysis was made. A critical review was adopted to analyze the studied e-Procurement adoption models found in the literature review towards a framework development.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter presents an in-depth analysis of the data obtained from the field. The data was processed using Statistical Analyst and presented with tables, charts and graphs before analysis was made. All the data used in this analysis was first-hand information collected from the sample of interest. This chapter is divided into four parts based on the objectives of the study. The first part looks into the current demographic characteristics of the respondents, second part looks at the Procurement Practices of the government hospitals, third part looks at structures that may be required to make e-Procurement possible and the last part looks at the development of a framework for adoption of effective e-Procurement practices by Kumasi government hospitals.

4.2 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Demographic characteristics of respondents took into account the gender of respondents, level of education and years of experience in procurement practices. This is to help the study get a general idea of the background of survey respondents.

4.1.1 Gender

The gender of the twenty respondents was sought. From the pie chart in Fig 4.1, 85% of the respondents representing as much as 17 were males while the other 15% were females.

This is very striking as women in times past were known to be best at buying and selling with better bargaining skills than their male counterparts. The study revealing more males than

females presupposes that males are now gaining grounds and out weighing the females in procurement.

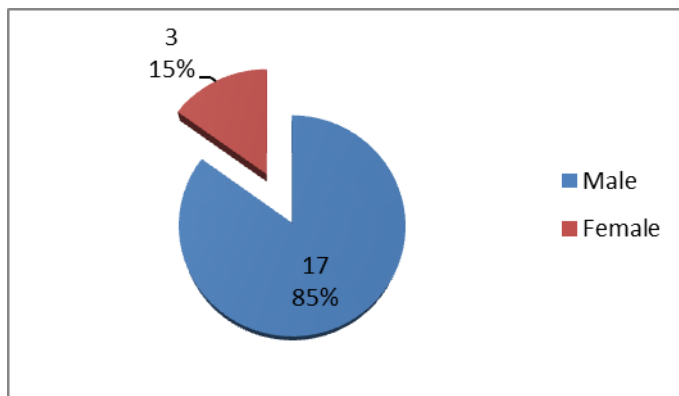


Figure 4.1: Gender of respondents
Source: Field Data

4.1.2 Level of Education

The level of education of the respondents was also sought. This is as shown on the column chart in Fig 4.2. Most of the respondents (11) were Advance Diploma and First Degree holders. This was followed by 4 respondents who were Master's degree holders. Three respondents had obtained diploma while 1 respondent each had obtained certificate and other professional qualification. They are well educated to provide logical and accurate information on procurement issues in the various hospitals.

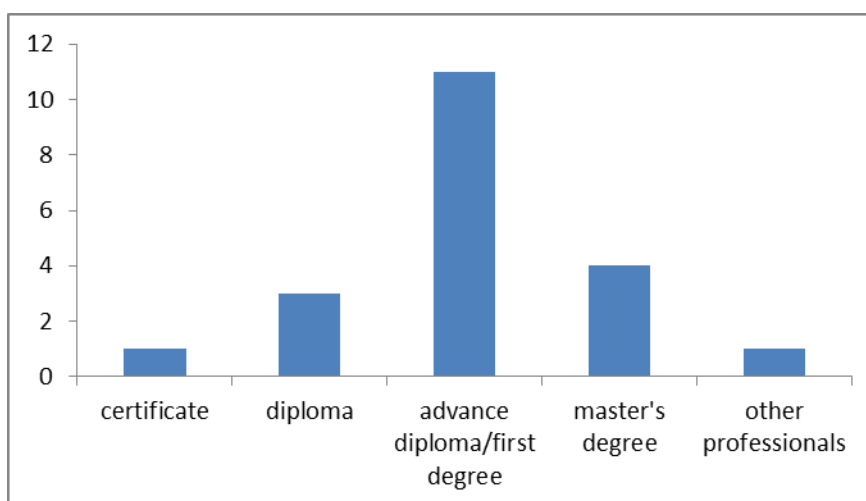


Figure 4.2: Level of education of respondents
Source: Field Data

4.1.3 Number of years of experience in procurement practices

From the figure 4.3 all workers at the SCMU in the hospitals of interest have had some years of experience in procurement practices. Exactly 50% of the respondents had between five to ten years of procurement practice. This was followed by 25% having had between three and five years' experience in procurement practice. Only 10% of respondents had less than three years' experience in procurement practice. Fifteen of the total number of respondents had more than ten years' experience in procurement practice at the hospitals.

The above finding shows that more of the respondents have enough experience in procurement practice; therefore issues of procurement may not be as much challenging to them. This is so because experience they say is the best teacher. With their expertise, knowledge and experience in procurement, they are bound to provide useful data for the study and better prepared for the introduction of e-procurement system.

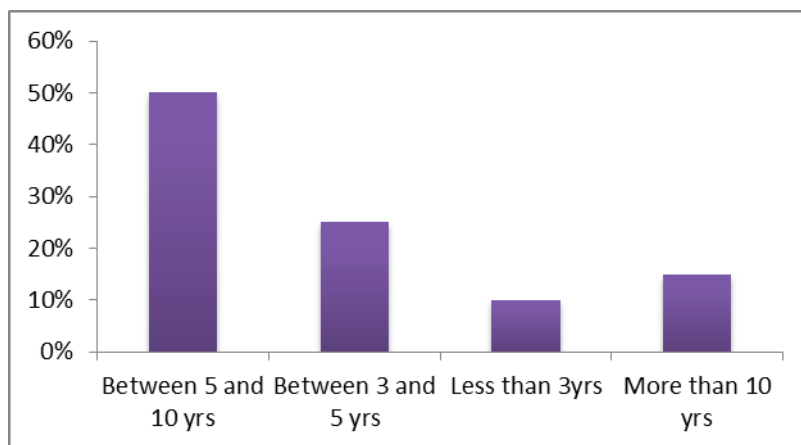


Figure 4.3: Years of experience in procurement practice

Source: Field Data

4.2 PROCUREMENT PRACTICES OF THE GOVERNMENT HOSPITALS

The procurement practice of the government hospitals was considered important because that will give the indication of whether they would need and benefit from the e-Procurement

system. The traditional procurement practices on non-internet use are paramount in all government institutions.

4.2.1 Hospitals having Supply Chain Management Unit (SCMU)

All the four hospitals had SCMU in place to oversee the procurement affairs of the hospitals. This finding reveals that all the hospitals practice procurement. This is shown on table 4.1 below. This is seen as a good practice since it allows the other workers at the hospitals to work without worrying their heads about where to get what and at what price. It helps the hospitals to make informed and rational buying of goods and services.

Response	Frequency	Percentage
Yes	20	100

Table 4.1: Hospitals having SCMUs

Source: Field Data

4.2.2 Number of years SCMU has been practicing procurement

Since all the hospitals had SCMU, the study sought to find out how long the hospitals have been practicing procurement. This was to give an indication of the judicious use of the money of the hospitals for the past years with regards to procurement. Figure 4.4 shows that 80% have been practicing the procurement for five to ten years while 15% have practiced for only one to five years. One representing 5% was not sure about the number of years the hospitals have been practicing procurement.

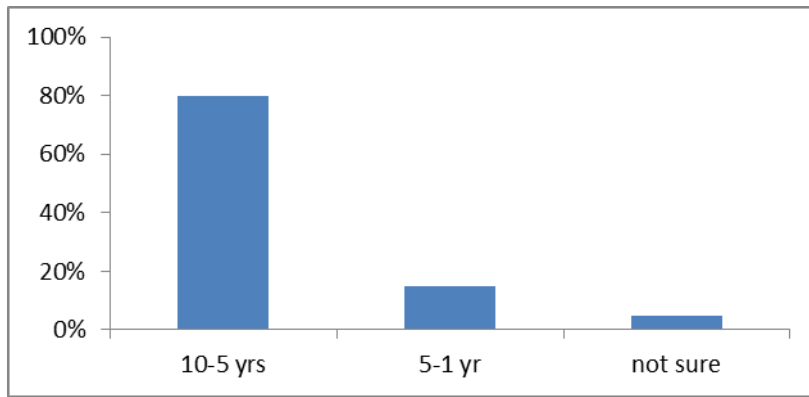


Figure 4.4: Number of years SCMU has been practicing procurement

Source: Field Data

4.2.3 Procurement system in practice

Procurement could be centralized or decentralized. Centralized procurement system has all procurement activities vested in the organization itself. This system facilitates e-Procurement better. Figure 4.5 show that as much as 85% of the hospitals had centralized procurement system by the SCMU. 10% practiced decentralized procurement system by the SCMU while 5% could not decipher as to whether they practiced centralized or decentralized procurement system by the SCMU.

With centralized system of procurement, the SCMUs of the hospitals are responsible for purchasing their own items. This gives them concentration on their assigned roles. Bulk buying also increases the bargaining power of the centralized procurement staff. Decentralized system may have a down side of product specification and making e-Procurement implementation difficult.

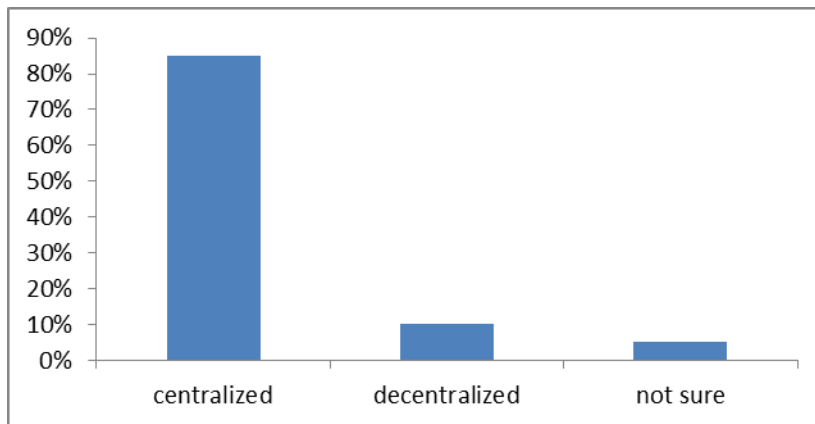


Figure 4.5: System of procurement practiced by the SCMUs
Source: Field Data

4.2.4 Most procured type of item

Procurement is responsible for goods, works and services in these current times of supply chain management. Respondents were asked the type of items that are mostly procured. The results are as follows; eighty percent of the respondents said goods were the most procured items, followed by 10% each of services and works. E-Procurement saves time, cost and very efficient. The hospitals must start with goods in order to realize the benefits quickly.

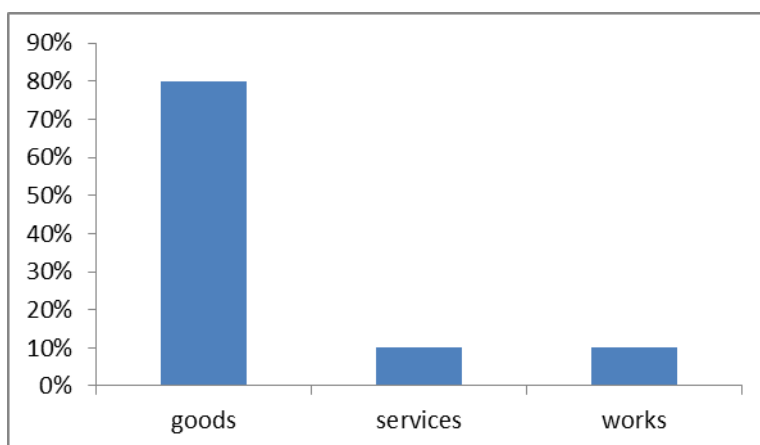


Figure 4.6: Type of item most procured
Source: Field Data

4.2.5 Method used in the selection of supplier by the SCMUs

Method used	Frequency	Percentage
Competitive Tendering	20	53
Single Source Procurement and Selection	5	13
Restricted Tendering	4	10
Prequalification	3	8
Price Quotation	6	16
Total	38	100

Table 4.2: Method used in the selection of suppliers by the SCMUs

Source: Field Data

This survey was done to identify the most usable method among all the other methods used to procure. From the Table 4.2 above, 53% of suppliers selected by the hospitals' SCMUs are through competitive tendering. Thirteen percent are selected through single source procurement whereas 10% are selected through restricted tendering. Suppliers selected through prequalification and price quotations are 8% and 16% respectively.

The above presupposes that competitive tendering is the main method used to select suppliers. This shows that the competitive tendering is mostly used in the procurement entity. It creates competition between suppliers resulting in "value for money" for purchasers and users. Competitive tendering also offers a kind of transparency and litigates against favoritism and corruption. The e-Procurement will promote transparency in the competitive tendering that they used to proceed.

4.2.5 Qualified Supplier Selection

Figure 4.7 shows that 70% of qualified suppliers are selected within the Tender Evaluation Panel Members while 25% are selected by the Tender Committee of the Hospital. Only five percent is selected by other means. The tender evaluation panels evaluate and select tender of

the lowest evaluated bidder before the entity tender committee awards the contract to the lowest evaluated bidder.

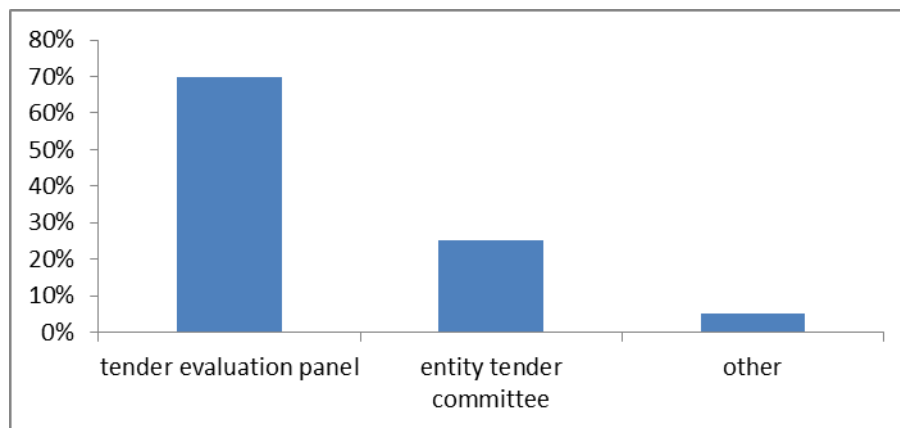


Figure 4.7: Selection of qualified suppliers

Source: Field Data

4.2.6 Advertisement of Tenders

With the influx of modern technology, there are so many ways of getting the public aware of what is needed in the twink of an eye. The hospitals were asked of how they advertise their tender to make the public aware. The two main channels given were the print media and the electronic media.

More than two thirds (85%) of the tender adverts are done through the print media (Newspaper) whereas 10% are done through the electronic media (internet). Only five percent are done through other means such as phone calls to known suppliers and contractors. This is shown on the figure 4.8. Electronic devices are now common with people. Advertising with the internet and communication networks like mobile phones would be more efficient than that of the use of newspapers and others. The use of electronics in advertising tender is part of the e-Procurement solution.

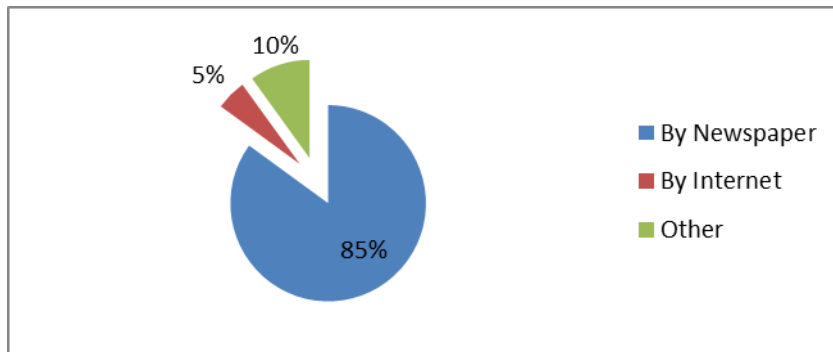


Figure 4.8: Advertisement of tenders by the hospitals

Source: Field Data

4.2.7 Invitation of suppliers by the SCMUs

How suppliers are invited by the SCMUs of the hospitals was sought so as to compete for tendering at the evaluation level. Figure 4.9 shows that 11 respondents representing 55% are invited by mail/letter. This is a paper document in a sealed envelope addressed to the supplier. Electronic mail which is a means of sending messages over the internet accounted for 25% of the ways of inviting suppliers by the SCMUs of the hospitals. Other means of invitation accounted for only 20% with four respondents. Information delivered online is seen more private than that of mails and others as both the purchaser and the supplier are with passwords that secure their delivery boxes. E-Procurement ensures more privacy in the supply chain.

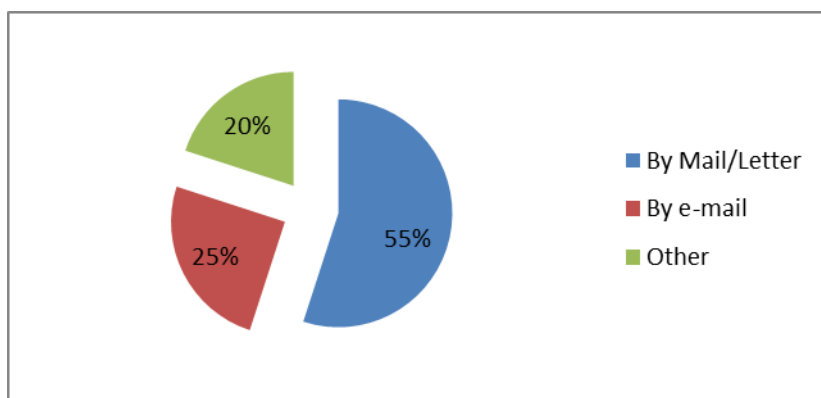


Figure 4.9: Invitation of suppliers by the SCMUs

Source: Field Data

4.2.8 Tender Receipt Durations

From figure 4.10, the SCMUs of the hospitals can receive tenders from eligible suppliers for days, weeks and months as well as for some other duration. Seven representing 35% of the respondents said tenders were received in days and 8 representing 40% said they were received in weeks. Four representing 20% said tenders were received for months while only 1 representing 5% said they were received by other periods. Electronic means of delivering tender will be in days, since electronic documents are received the moment that they are sent.

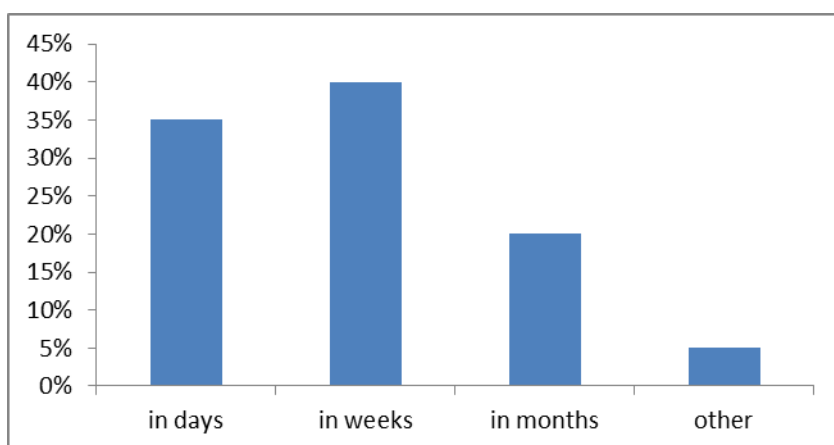


Figure 4.10: Tender receipt durations from suppliers

Source: Field Data

4.2.9 Adequacy of quantity of tenders received during tender

If suppliers are more and adequate, the SCMUs have a wide range of choices to choose from. This is because all the suppliers come to the table with different offers especially with price and product quality. Figure 4.11 shows that 80% of the times, suppliers are often adequate whereas 15% of the time they do not often get adequate suppliers for tendering. According to one respondent constituting 5%, said suppliers are always adequate for tendering. E-Procurement attracts more tenders due to the electronic advertisements that take place on the internet and text messages on mobile phones.

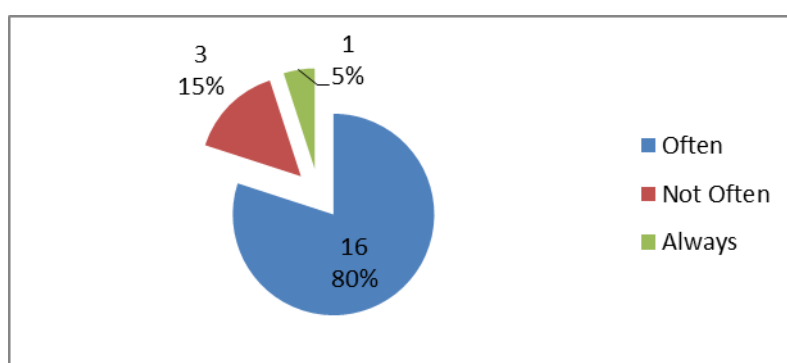


Figure 4.11: Receipt of adequate suppliers for tendering
Source: Field Data

4.2.10 Notification of contract award to the lowest evaluated bidder

The lowest evaluated bidder is always notified and invited for negotiations of the awarded contract by the procurement entity. Figure 4.12 shows that 45% of the total number of respondents said that contract award notice the lowest evaluated bidder through mail or letter, 25% said it was done through e-mail while 5% said it was done through the Newspaper. The remaining 25% said it was done through other means such as phone calls. Contract award notifications should be best done on phones since the winner has to meet panel for contract negotiations soon after evaluation before the contract is commenced or administered.

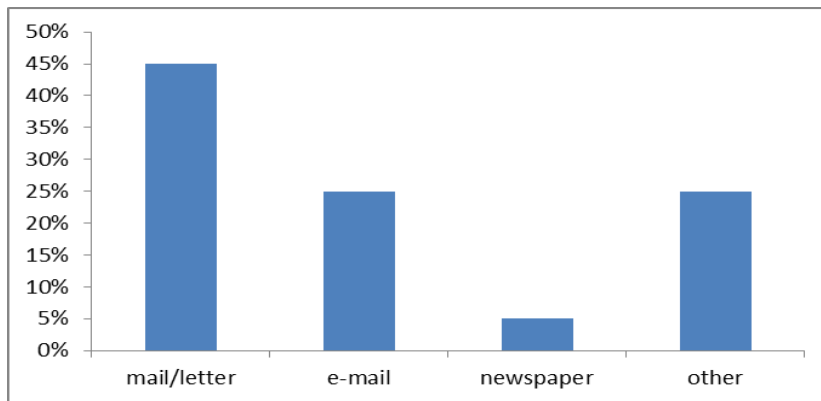


Figure 4.12: How lowest evaluated bidders are notified

Source: Field Data

4.2.11 Conflict of interest between entity and supplier

Conflicts in procurement can be very delimiting especially to the competitive tendering procedures. In instances where goods supplied do not match the specifications of the SCMU or contracts are giving to illegible suppliers, conflicts ensue. When this happens, goods may be returned or retender the contract. Figure 4.13 shows 14 respondents representing 70% agreeing that there had been conflicts before between SCMUs of the hospitals and suppliers while 6 representing 30% said there had not been anything of that sort. Since every human society is prone to conflict because of differing views, it stands to reason that despite the competitive tendering of the procurement process there may be misunderstandings but solved amicably. E-Procurement may reduce conflict issues in procurement to zero.

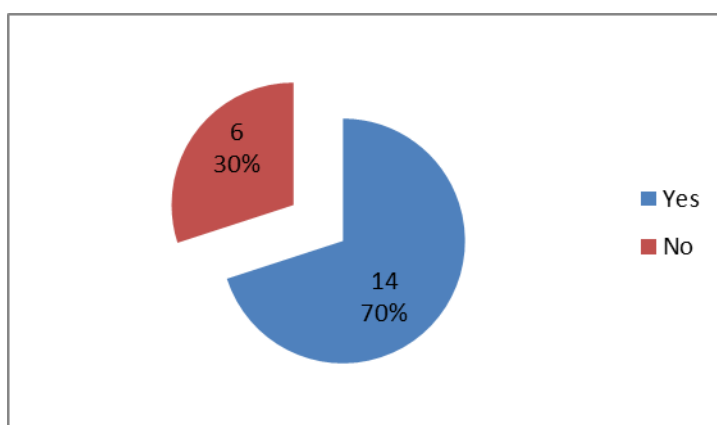


Figure 4.13: Conflict of interest between entity and supplier

Source: Field Data

4.2.12 Contract negotiations with winning bidders

The procurement managers in the SCMUs of the hospitals meet with the winning bidder and negotiate contract terms with the supplier. Before this process legal advice is sought by the SCMUs and written specifications are assessed against the offer of the winning bidders.

Suppliers are asked to provide documentary proof of their ability to provide what they profess they can provide. They are also assessed on similar projects and the quality of such projects. This is to ensure that they are paid in accordance with the best price for the quality goods, works or services delivered.

4.3 STRUCTURES IN PLACE THAT WOULD MAKE E-PROCUREMENT POSSIBLE

For e-Procurement system to be possible there must be some structures and resources in place. Resources such as computers and the internet are the two essential resources that can make e-Procurement adoption possible.

4.3.1 Availability of computers at the hospitals.

Figure 4.14 below shows that 85% of the respondents considered that number of computers found in the hospitals adequate while 15% did not consider the number of computers at the hospitals to be adequate.

The above indicates that since more than 50% of the respondents considered the computers in the hospitals are adequate; the hospitals can start with the existing computers in the e-Procurement practices. Computers are needed to be connected to the internet to facilitate the e-Procurement system.

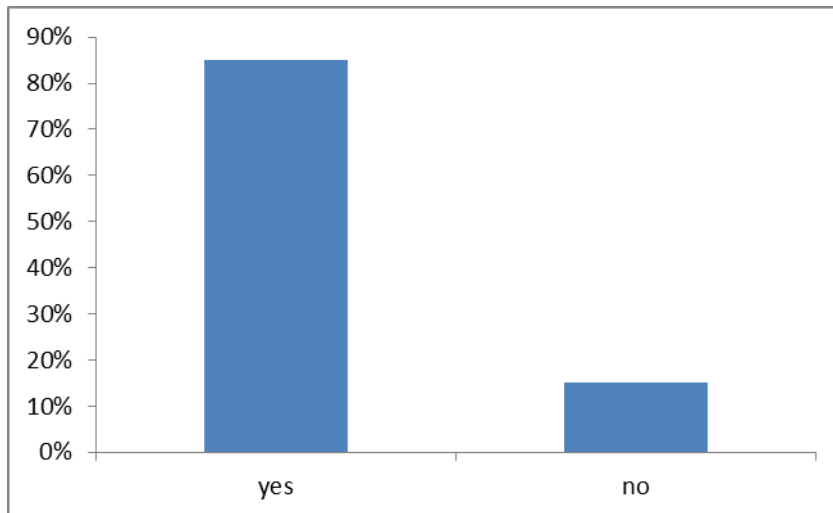


Figure 4.14: Hospitals having adequate computers

Source: Field Data

4.3.2 Access to Internet

Due to the preceding finding, the study was eager to know if the hospitals had access to the internet. Interestingly, all the hospitals had access to the internet. To the dismay of the author, the internet was used only for checking of staff e-mails and surfing the internet, which seems to be part of the e-Procurement practices as expressed by Rajkumar (2001) in the conducted literature. This is seen as very good since the internet together with the computers can provide a very good basis for e-Procurement. These resources were working and in good shape. With these resources e-Procurement adoption is possible.

4.3.3 Possibility of electronic procurement

Respondents were asked if with their computers and internet connectivity, procurement can be operated electronically. As much as 90% of the respondents answered in the affirmative that it can be operated electronically since their computer and internet systems are working and up to date. However, 10% of the respondents said procurement cannot be operated electronically. This is presented graphically in figure 4.15. The results from this analysis showed that the 10% of the employees may not even aware of the e-Procurement solution.

Therefore the perceived benefits may not be known to them. They may also be thinking of risks associated with the new system.

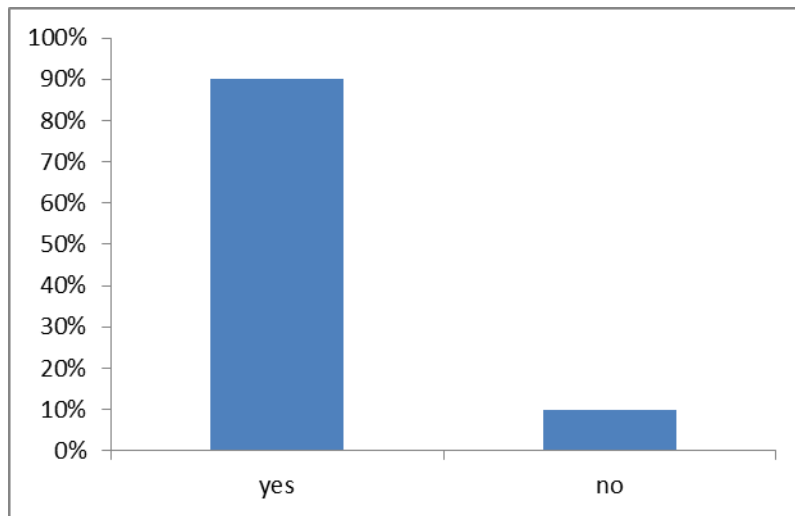


Figure 4.15: Possibility of electronic procurement
Source: Field Data

4.4. DEVELOPMENT OF A FRAMEWORK FOR ADOPTION OF EFFECTIVE E-PROCUREMENT PRACTICES BY KUMASI GOVERNMENT HOSPITALS.

For the purpose of developing a framework on e-Procurement adoption, critical review was conducted on the theoretical framework developed in chapter two of the study and was therefore analyzed in accordance with the study objectives to form the building blocks for the developed framework. The following were the results obtained after reviewing the theoretical framework:

Gunasekaran and Ngai (2008) considered perceived benefits of e-Procurement, perceived barriers of e-Procurement, critical success factors of e-Procurement adoption and perceived organizational performance with e-Procurement as the main building blocks for their framework for e-Procurement in the public organizations after the critics on the Vaidya et al, (2006) study revealed the absence of barriers and benefits of e-Procurement adoption.

Gunasekaran and Ngai (2008) framework too did not satisfy all the requirements for a public e-Procurement adoption because the framework only outlined the benefits, barriers, critical success factors and organizational performance of the e-Procurement. From the study objectives, there must be the need to know the current status and readiness of the government hospitals in Kumasi before the adoption. This will enable the study to identify the current procurement system and practices as well as the structures that should be in place to run the e-Procurement system. Benefits therefore should be outlined as found in Gunasekaran and Ngai (2008) study, followed by perceived risk instead of perceived barriers since the study was dealing with ready-to-adopt organizations and not with the entire society or the general public. Before the critical success factors and organizational performance, there should be user uptake training programs and a supplier adoption strategy. System integration for e-Procurement performance and measurement should also be involved because this structure ensures the smooth running of the e-Procurement system since it concerns business to business transactions and security and uninterrupted running of the system was not be left out.

All contracts should be governed by legal frameworks (law) as there could be fraud and conflicts of interest between the parties. Just like the Act 663 protects both the buyer and the supplier in the public procurement system in Ghana since 2003. There was an idea from the literature review of including a legal framework between the procurement transactional parties to meet the UNCITRAL, (2011) goal on public e-Procurement regulations.

4.5. THE FRAMEWORK

The developed framework for the e-Procurement adoption by the hospitals starts with the system awareness as done through the interview at the various hospitals. For the hospitals to adopt e-Procurement they must therefore check their status and readiness for the

implementation of the system. If the analysis is affirmative, they can proceed on and if not, then they have to update their system to admit the e-Procurement system. For the process to continue there should be another analysis on the perceived risks and benefits followed by the acquisition of programmable software which can enhance effective business to business transactions. There should also be education for users and introduction of manuals and checklist for the proper running of the new system. The software to be used must be well protected to save vital documents from fraud and phishing. The supplier awareness and education is also relevant because of their involvement in the supply chain. The system should be tested and assessed to know its efficiency and performance. Legal framework should therefore be put on the system if the process proves right.

The building blocks used in the framework developed in Figure 4.16 discussed in detail with how the procedure should go through:

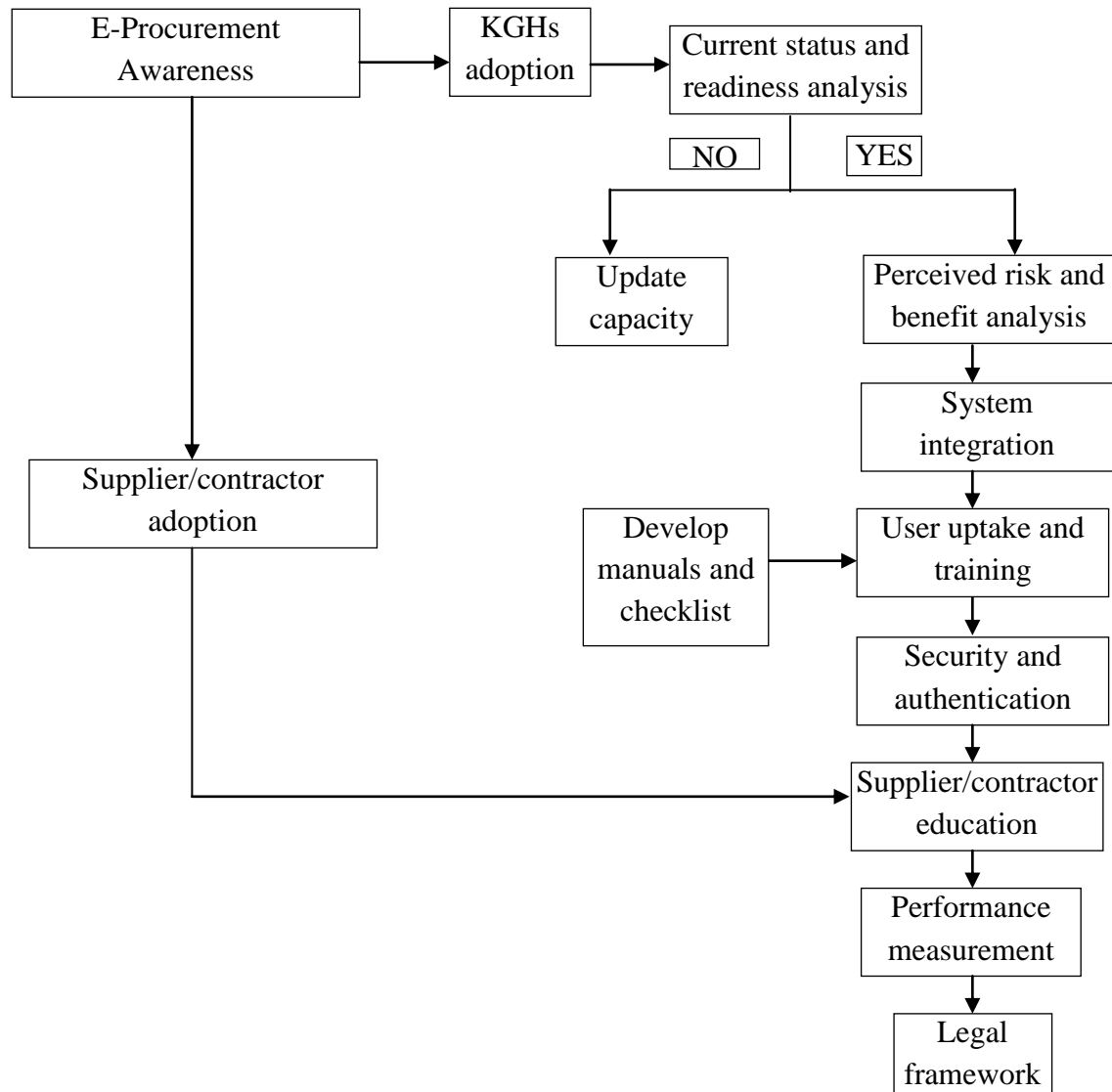


Figure 4.16. A framework for adopting e-Procurement in Kumasi Government Hospitals (KGHS).

Source: Author's Construct

4.5.1. E-Procurement Awareness and Adoption

Public procurement is about the utilization of public funds by government entities in the purchasing of goods, works and services so as to achieve the value for money. E-Procurement as defined by different studies confirmed that it is the use of information technology (IT) in the purchasing of goods, works and services with the intention to trade within the world wide web. E-Procurement adoption is not too complicated as individuals may think but rather a

simple system driven by the internet broadband that could be accessed anywhere globally and has greatly improved the accessibility of tenders (Panayiotou et al, 2004). The system streamlines through connections of stationary and mobile computers to the internet with suitable business to business software that performs integration of two or more functions. To achieve a successful adoption and implementation by the Kumasi Government Hospitals (KGHS), both the hospitals and the suppliers/contractors must beware of the system and the entity must think of how to proceed on with the implementation procedure.

4.5.2. Current status and readiness of the hospitals

This block is composed of the nature of the organization which is ready to adopt the system, need for e-Procurement, size of the entity, nature of the market, technology levels and skills available for e-Procurement implementation, Internet and world wide web access, organization growth goals, extent of need for globalization, logistics support systems. The current procurement system of the government hospitals under study from the analysis was known to be the paper-based transaction and centralized system of procurement. This certified that the hospitals are not already into the e-Procurement system and the centralized system since they procure on their own will enhance effective e-Procurement practices. Pasiopoulos et al, (2013) commented in the literature that, for organizations to adopt effective e-Procurement practices, they should either abolish or reduce the traditional paper-based procedure and replace with new procedures based on the use of computer and information technology may consist some of the major changes. From the analysis, the hospitals have adequate computer and internet systems with IT experts because they are already in use and are ready to adopt the e-Procurement system. This would promote the principal objective of e-Procurement which is the value for money. The hospitals need this system because of regular procurement of goods and services that consumes more paper which does not aid

sustainability of the environment. As commented by Walker and Brammer, (2009) in their sustainable procurement study.

4.5.3. Capacity update

In case the hospitals do not have the required infrastructure to support the adoption of the system, they have to acquire the adequate computers and the internet system to support the e-Procurement adoption. The hospitals also need to have IT experts who can help the system move on more effectively and efficiently.

4.5.4. Perceived benefits of e-Procurement

Perceived benefits Promote understanding of the strategic impact of e-Procurement on organizational performance, potential for reduction in costs and prices, impact on business growth, global market access, wider pool of potential suppliers, enhanced collaboration with suppliers, improved communication and information flow, better control of material flow along the supply chain, increased customer service and satisfaction and in turn business growth and new opportunities (Gunasekaran and Ngai, 2008). Aberdeen (2005) after a benchmark survey, reported that e-Procurement is consistently delivering significant benefits to enterprises and organizations as it improved compliance; reductions in off-contract spending, reductions in requisition-to-order cycles and costs, and percentage of total enterprise spend under management of procurement. The hospitals, after a long term inability to purchase online will benefit a lot with the e-Procurement system as the system is deriving benefit attained from technological enhancements rather than using traditional a paper based method in procurement operations (Angeles and Nath, 2007).

4.5.5. Perceived risk of e-Procurement

Smith (2003) study revealed that the sudden cause of change by e-Procurement put at risk the implementation success in its adoption for the employees of the procurement unit. Pasiopoulos et al, (2013) and Rajkumar, (2001) studies contain the information delivered below:

- **Internal business risks:** Organizations are uncertain about whether they have the appropriate resources to successfully implement an e-Procurement solution. Implementing an e-Procurement solution requires not only that the system itself successfully performs the purchasing process, but most important, that it integrates with the existing information infrastructure. This internal information infrastructure includes systems such as accounting, human resources, asset management, inventory management, accounts payable, production planning, and cash management systems. Most organizations adopting or looking to adopt e-Procurement software already have significant investments in these other systems; integrating these new technologies with existing platforms should happen as smoothly as possible. Failure to integrate creates duplicative work steps and jeopardizes the reliability of organizational information.
- **External business risks:** E-Procurement solutions need to not only “talk” with internal information systems, but also need to cooperate with external constituencies mainly customers and suppliers. External constituencies need to develop internal systems that facilitate the communication through electronic means an issue that demands technology investments as well as incentives for these constituencies. For e-Procurement technologies to succeed, suppliers must be accessible via the Internet

and must provide sufficient catalog choices to satisfy the requirements of their customers.

Ideally, suppliers will provide e-catalogs in the formats required by customers, reflecting custom pricing and/or special contractual agreements, and will send updates on a regular basis. Lack of a critical mass of suppliers accessible through the organization's e-Procurement system would limit the network effects that underlie these technologies, further hindering the acceptance and adoption of the technology. Cooperation with external parties also requires new suppliers and customers to meet the business criteria that organizations have set to accept them in their networks. Since some of the business models associated with e-Procurement technologies (e.g., auctions, consortia, and exchanges) clearly envision the use of suppliers with whom the buyer has not previously transacted business, companies need to develop mechanisms that provide the buyer with assurances that the supplier meets or exceeds recognizable and industry enforced standards relating to supplier quality, service, and delivery capabilities.

- **Technology risks:** Organizations also fear the lack of a widely accepted standard and a clear understanding of which e-Procurement technologies best suit the needs of each company. The lack of a widely accepted solution blocks the integration of different e-Procurement software across the supply chain. The significance of this risk factor seems to suggest the need for clear and open standards that would facilitate inter-organization e-Procurement technologies. Without widely accepted standards for coding, technical, and process specifications, e-Procurement technology adoption will be slow and will fail to deliver much of the benefits expected.

4.5.6. System integration

The system will have to integrate with back- end office systems such as ERP and database systems (Turban, 2008). Examples of the ERP software are shown in the appendix of this study. Applications that run at the back end must be fully integrated as how the various technologies are interrelated and used by the hospitals. On the buy side, a purchaser uses buyer software to search the organizations' internal catalogs (which contain an aggregated list from all suppliers that is a virtual catalog), or to search an intermediary marketplace site and place an order. The order will go through the market- place only if the customer searches for the latter and places an order there.

4.5.7. User uptake and training

According to Vaidya et al (2006), the high level of user uptake and training is positively associated with the organization and management implementation perspective of an e-Procurement initiative. Panayiotou et al (2004) argued that training programs provide knowledge and primarily experience of computers and new information technology, making employees more confident in the system performance. There will be also need of developing manuals and checklist to support the system manipulation. As e-Procurement includes new technologies and changes in traditional procurement approaches, the need to train staff in procurement practices and the use of e-Procurement tools are critical to the success of an e-Procurement initiative. Users can realize the immediate benefits of the e-Procurement system once they understand the operational functionalities. This means that training should be given a high priority, alongside the need for public sector agencies to identify the skills required by all those engaged in procurement. As technology alone does not ensure successful adoption, the success of a public sector e-Procurement initiative depends on users and buyers making

use of the new process and system. The success of the project also depends on communication to the users. As the implementation process develops, periodic user satisfaction surveys may identify the possible need for additional training. The lack of system knowledge may create anxiety, negative attitude and diffusion to use e-Procurement technology.

4.5.8. Security and Authentication

Because of the sensitivity of procurement issues and privacy nature of orders and payments, security of data is critical in e-Procurement systems. The system must have mechanisms for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order. In an e-Procurement environment, relate the security requirements at the e-Tendering stage to authentication. The e-Procurement systems and processes need protection because they involve a financial transaction and may be vulnerable to fraud. Vaidya et al (2006), highlight the need for transactions between different systems to be exchanged in secure ways with absolute assurances regarding the identities of the buyers and suppliers. In order to encourage buyers and suppliers to engage in e-Procurement, it is critical that both parties have complete confidence and trust in the underlying security infrastructure. According to Gralla (2007) and Bichler (2000), the Internet represents an insecure channel for exchanging information leading to a high risk of intrusion or fraud, such as phishing.

4.5.9. Supplier/ Contractor Education

The organization should assess the impact of the system on suppliers and their technological readiness to implement the system at their end, and should provide the services necessary for the system to succeed (Rajkumar, 2001). For example, suppliers must be able to provide the

catalog information for their products into any system that is designed. It is necessary the hospitals put together a supplier adoption team, educate the suppliers, and get them ready concurrent with the organization's implementation.

4.5.10. Performance measurement

The greater level of use of the performance measures is positively associated with the practices and processes implementation perspective of an e-Procurement initiative. Flanegin (2006) admitted that organization agility demands efficient workflow and prompt responses to requisitions and requests for approval in the procurement industry. It has been therefore from the Rajkumar (2001) study that systems that are not extensible and flexible enough to model any aspect of the procurement process shopping, oversight and analysis, or supplier management will be inconvenient to use and suffer poor adoption rates. The e-Procurement system must be simple and flexible for adoption and implementation so as to encourage easy assessment for good performance in the process.

4.5.11. Legal framework

The law has as a general purpose to set the rules and principles applicable to all contracts concluded and performed by public entities (Laguado-Giraldo, 2005). Regulatory framework, including primary legislation such as laws or secondary legislation as decrees or presidential orders must be seen as the starting point of any government procurement (GP) system. It settles the administrative GP procedural rules, provides legal basis and ensures private and public parties' rights and responsibilities. The regulatory framework connects the administrative GP process with all other institutional structures (public expenditure, fiscal control, etc.). The framework ensures the means that can be used, that is information

technologies or paper-, in the procurement (UNCITRAL, 2011). There must always be a legal bond between the purchaser and supplier to promote integrity between the two parties. According to PPA, Ghana (2012), the World Bank in its action plan is in the process of instituting a common by-law for all public e-Procurement users around the globe.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

All the four studied government hospitals do have SCMUs and SCM experts with a minimum qualification, Diploma. The workers are of more experience and very competent with their roles in the management. It was found out that the hospitals are in a centralized system of procurement and the answers given to their approach of advertisement and invitation of tenders showed that the hospitals are practicing the paper-based procurement. Although, the hospitals practice paper-based procurement, they recorded less frequency of conflict of interest. This came as a result of frequent use of the competitive tendering as a methodology. They also procure frequently goods than works and services. The entities receive adequate tenders to tender for contract awarding and always receive tender in weeks. They showed their readiness for the e-Procurement system by expressing their views as to explain how the system could be performed, perceived benefits and a whole lot. The infrastructure (computers and the internet system) available can strongly support the e-Procurement solution as the opinion has been confirmed by the literature review. Literature survey was conducted on e-Procurement solution software and the outcome was the ERP which is also known as B2B software. A framework has been developed for e-Procurement adoption in Kumasi government hospitals. The developed framework will therefore provide guidelines for e-Procurement adoption and implementation. The framework shows all what it takes to start the system adoption by determining the organizational current status and readiness for e-Procurement solutions, perceived benefits, the risk involved in the system implementation, required training for the procurement practitioners, suitable software for the system

integration and a legal framework that will protect both the buyer and the supplier in the supply chain management.

5.2 CONCLUSION

The results of this study have shown that procurement activities by the SCMUs of the hospitals are done through the traditional paper based method. Despite the years of experience of the procurement officials and the number of years the hospitals have been practicing procurement, they are affected in speed and efficiency of the activities due to the paper based method of procurement still in use. There are structures and resources in place to support e-Procurement. Computers were adequate and strong enough and were connected to the internet to facilitate electronic transactions. The infrastructure that the hospitals have can support the e-Procurement adoption since studies have confirmed that either stationary or mobile computer and internet systems could be used for the operations.

Except the integration software (ERP), that is not available currently at the hospitals. The ERP has several types from which oracle, ariba and peoplesoft are the examples. A coalition of studies deeply involved in the procurement process of public purchases, has joined together on a set of common principles addressing the use and impact of electronic methodologies in the procurement of goods, works and services of the government hospitals. The related studies of this study acknowledge that the advent of electronic procurement offers an unprecedented opportunity to reduce processing costs, enhance transparency and increase efficiency for all parties. Such electronic methodologies, however, must be open, interoperable and have adequate security and privacy safeguards to preserve and promote the integrity of a competitive procurement environment. At a minimum, electronic methodologies within the procurement should adopt clear procedures that reduce confusion and allow access to all qualified bidders. Further, any process should not affect the legal

rights and responsibilities of all parties: suppliers, consultants, construction managers and contractors. This study serves to establish common parameters for all public hospitals to adopt the electronic procurement.

5.3 RECOMMENDATIONS

Various recommendations are made based on the findings of the study. Below are some outline recommendations.

1. The hospitals should strongly consider the electronic means of procurement. This is because the traditional paper base method of procurement is not sustainable and with its associated problems of delays and lack of transparency. Since the hospitals have computers and access to the internet, quitting or reducing the paper base method should not be a problem.
2. Hospitals are to make use of the internet for the advertisement of tenders. A website and a page which advertises tenders must be possessed so that suppliers can sit in their offices and see what is advertised.
3. All communications should be electronically done since this is fast and convenient.
4. The SCMUs in the hospitals should consider the need
 - For special training on e-Procurement practices by ICT and business service providing experts.
 - To create a group of internal ICT experts.
 - To preserve customary purchasing procedures.
 - To organize technical education on e-Procurement to stakeholders (ie. suppliers, internal users; government representatives).

5.4 RECOMMENDATIONS FOR FURTHER STUDIES

Despite the importance of adoption and the government efforts in pushing the use of ICT in business, the adoption rate of e-Procurement in Ghana is low. This may be because the understanding of the drivers of e-Procurement adoption as well as perceived impediments, and how these vary between firms and between activities, is lacking.

Related to the observed low rate in e-Procurement adoption, there is an urgent need for research that can ascertain variations in e-Procurement adoption based on organization differences, business size differences and complexity of products. This is a necessary prerequisite to enable the development of a predictive framework or model of e-Procurement adoption. This can also assist in identifying firms, management styles and activities where e-Procurement is likely to either excel or lag.

E-Procurement is still a relatively recent phenomenon and the need for the research framework examined in this paper is apparent in terms of the inconsistency between proclaimed national and organization benefits deriving from a faster uptake, and the slowness of adoption. A predictive model of e-Procurement processes can be used to improve the formulation and targeting of procurement industry. Innovation policy can be used on how to access these advantages and the removal of impediments. Improvement in the rate of e-Procurement adoption will have national economic benefit through improved productivity that can strengthen the national competitive advantage in rapidly adopting firms and organizations. However, there is no call for the business sector to be innovative in the use of e-Procurement, for the sake of innovation. Management orientation needs to be towards effectiveness and practicability. Frameworks on electronic tendering process and online pharmacy must be studied.

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APPENDICES

APPENDIX I

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

**A FRAMEWORK FOR ADOPTING ELECTRONIC PROCUREMENT (E-
PROCUREMENT) IN KUMASI GOVERNMENT HOSPITALS**

Dear sir/madam,

I am a student from the Department of Building Technology, KNUST Kumasi. I wish to conduct an interview on e-Procurement adoption in Kumasi Government Hospitals. The study is for academic purpose only. Please answer the under listed questions as accurate as possible. The information provided will be confidential and there is no way respondents identity would be appeared anywhere in the study.

You are required to answer or decide not if it seems to be irrelevant.

I will be glad, if you could spend part of your time to answer the questions for me.

Thank you.

QUESTIONNAIRE

Please tick or write where appropriate

A. BACKGROUND OF RESPONDENT

1. Name of Respondent.....
2. Gender: Male ☐ Female ☐
3. Profession.....
4. Name of Hospital.....
5. Please tick the appropriate box to indicate the level of your Education and/or Professional qualification

<input type="checkbox"/> Certificate level	<input type="checkbox"/> Diploma
<input type="checkbox"/> Advance diploma/First degree	<input type="checkbox"/> Masters Degree
<input type="checkbox"/> Other Professional qualification: Please State.....	
6. Please indicate your years of experience in supply chain management?

<input type="checkbox"/> Less than 3 years	<input type="checkbox"/> between 3 and 5 years
<input type="checkbox"/> Between 5 and 10 years	<input type="checkbox"/> More than 10 year
<input type="checkbox"/> Not Applicable	

B. GENERAL INFORMATION ON SUPPLY CHAIN MANAGEMENT

7. Does the hospital have a Supply Chain Management Unit (SCMU)? Yes ☐ No ☐
8. Does the SCMU practice procurement? ☐ Yes ☐ No
9. How long has the SCMU been practicing procurement?

<input type="checkbox"/> 10- 5 years	<input type="checkbox"/> 5- 1 year
<input type="checkbox"/> Not sure	

20. What procurement system does the SCMU operate?

- ☐ centralized
- ☐ decentralized
- ☐ not applicable

21. What is the most frequently procured item?

- ☐ goods
- ☐ services
- ☐ works

22. Which of the following methods is used to select a supplier by the SCMU of the hospital?

- ☐ competitive tendering
- ☐ single source procurement and selection
- ☐ restricted tendering
- ☐ prequalification
- ☐ price quotation
- ☐ Any other (Please state).....

23. How are qualified suppliers selected by the SCMU?

- ☐ selected within the tender evaluation panel members.
- ☐ selected by the tender committee of the hospital.
- ☐ Any other (Please state):.....

24. How is tender advertised by the procurement entity (hospital)?

- ☐ By newspaper
- ☐ By internet
- ☐ Any other (Please state):.....

25. What medium does the SCMU use to invite suppliers to tender?

- ☐ By mail
- ☐ By e-mail
- ☐ Any other (please state):.....

12. How long does the SCMU receive tender from eligible suppliers?

- ☐ In days
- ☐ In weeks
- ☐ In months
- ☐ Any other (please state):.....

13. Does the SCMU receive adequate suppliers for tendering?

- ☐ Often
- ☐ Not often
- ☐ Any other (please state):.....

14. How does contract award notice the lowest evaluated bidder?

- ☐ Through mail
- ☐ Through e-mail
- ☐ Through newspaper
- Any other (Please state).....

15. Has there been any conflict of interest between the entity and a supplier?

- ☐ Yes ☐ No

16. How is a contract negotiated with winning bidders?

.....

17. Does the hospital have adequate computers? Yes ☐ No ☐

18. Does the hospital have access to the internet? Yes ☐ No ☐

19. If Yes, what does it use it for?

.....

10. Can procurement in government hospitals be operated electronically? Yes [] No[]

11. If Yes, how?

.....

.....

.....

APPENDIX II



Enterprise Resource Planning (ERP) Strategic Software

Source: Gill, 2011.



An internet system for stationary and mobile computer users

Source: Bidgoli and Hossein, 2004.