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Modeling an Effective E-Procurement System for Ghana's Healthcare Sector: A Critical Review and Proposal

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ABSTRACT

Increasingly, the use of e-Procurement has become of strategic importance for achieving the smart and sustainable growth objectives of many institutions including the healthcare sector. These notwithstanding many institutions in developing countries are facing tremendous challenges in leveraging the benefits of e-procurement. This paper reviews current literature on e-procurement system. It focuses on existing models and framework for the adoption of e-procurement in the healthcare sector. Typically, the paper reviews the current procurement practices in the related literature, concepts of other studies conducted with respect to the overall supply chain enhancement and value chain efficiency practices. Based on an evaluation of these concepts, a model framework is proposed for public hospitals in Ghana towards effective deployment, acceptance and use of e-procurement to accentuate healthcare value creation and customer satisfaction

Keywords : e-Procurement, PPA, e-Government, B2B, ERP, HTTP, SMTP, FTP, ICT

I. INTRODUCTION

Increasingly, the use of e-Procurement has become of strategic importance for achieving the smart and sustainable growth objectives of many institutions including the healthcare sector. This notwithstanding many institutions especially in developing countries is facing tremendous challenges in leveraging the benefits of e-procurement. This paper reviews current literature on e-procurement by focusing on existing models and framework for the adoption of the e-Procurement in the healthcare sector. Typically, the paper reviews the current procurement practices in the related literature, concepts of other studies conducted with respect to the PPA, 2012 report on monitoring and evaluation. The paper also reviews the structures that may support e-Procurement functions in the supply chain managements of e-Government hospitals. It also reviews 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.

An Overview 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)

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)

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.

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.

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).

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).

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).

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.

E-Procurement Model For Ghanaian Public 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.

The Proposed 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:

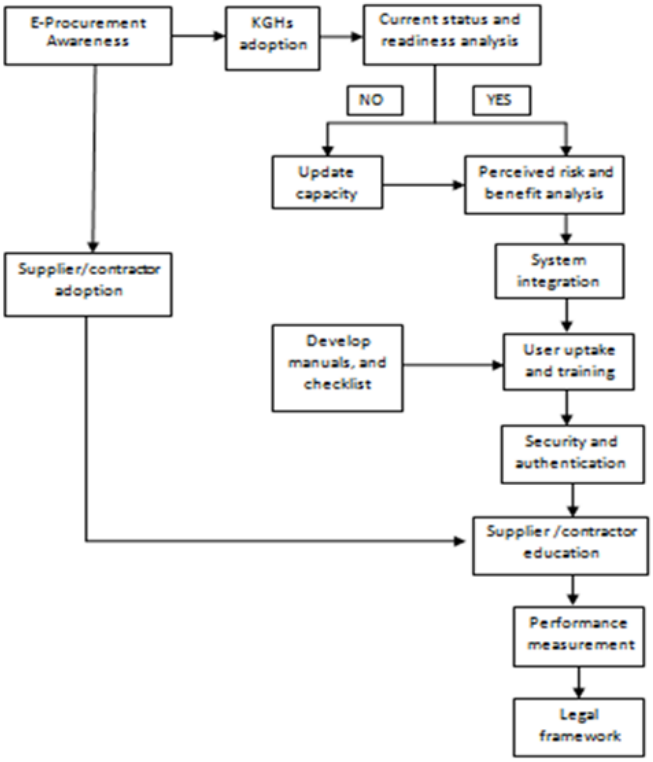

Figure 2. A framework for adopting e-Procurement in Ghana Government Hospitals
Source: Author's Construct

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.

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.

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. Nevertheless the conducted interview proves that the hospitals' capacity for e-Procurement adoption is already updated.

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).

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.

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.

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.

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.

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.

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.

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.

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