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Prospects and Challenges of E-Procurement in Some Selected Public Institutions in Ghana

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Abstract
This paper sought to investigate the prospects and challenges associated with the adoption of e-procurement in some selected public institutions in Ghana. Current literature on Public Procurement indicates a paradigm shift towards adoption of new technologies in Supply Chain processes that include e-procurement. The level of public sector response is influenced by various factors posing challenges to the adoption of e-procurement. The Ministry of Finance (MoF) was used as the case area; a sample size of 48 comprising of three respondents each were randomly sampled from the procurement departments of 16 Public institutions directly under the MoF. The research paper used a questionnaire as a key instrument for primary data collection. A one-way analysis of variance (ANOVA) tests was conducted. From the study, it was revealed that employee competency, inadequate legal framework, inadequate technological infrastructure and security of procurement transaction data were challenges to e-Procurement adoption in the organizations under review. The paper recommends among others that due to continuous turnover of employees, continuous training for incoming staff is required on e-Procurement. In addition, formal recognition backed by legislation of the electronic procurement transactions should be encouraged. Integration of the institutions system and those of the suppliers, demonstration of the positive impact of the system, and installation of linkages between all Governments agencies should be encouraged
Keywords: e-Procurement, Public Institutions, Ghana, Ministry of Finance, Adoption

1.0 INTRODUCTION

From the late 1990s, a raft of new e-commerce technologies emerged which promised to revolutionize working practices, threaten existing businesses and potentially create new business models (Sinha,2000; Bauru et al.,2001). Following this growth in use of e-commerce in business-to-business markets, there has been significant adoption of new supply chain-related technology and applications by organizations globally. The procurement function has been particularly affected by this trend with a predicted growth in e-procurement applications covering both transactional buying and strategic sourcing activities (Croom, 2000). One of the factors behind this development has been the evolution of the procurement function towards a more strategic role in supporting both corporate goals and supply chain objectives.

Indeed Ghana's Public Procurement Act, Act 663 (PPA, 2003) indicates that public procurement entities have different stages of implementation whilst many have no any form of e-procurement. That most of the Public Procuring Entities' (PPE) tender notices, evaluations and award notices are either not there at all or are not well published and not all records of the procurement processes are stored in retrievable systems. Procurement data storage and information dissemination can be improved by an e-procurement information system implemented on web technology which will allow data to be stored electronically. Owing to globalization and internalization of businesses the internet has become a viable tool for institutions, it has the ability to penetrate every corner of a society, an e-procurement information system will enable the public to have access to relevant information about public procurement on time and in a correct format at a minimum cost, providers will have access to the PPE's procurement plans and bidding documents through the internet hence competition among potential providers will increase. This will promote economic development (Tanner et al, 2008).

E-Procurement refers to the use of electronic methods in every stage of the purchasing process from identification of requirements through payment and potentially to contract management (Davila et al., 2003), There are six forms of e-procurement: e-ordering/e-maintenance repair operate, web-based enterprise resource planning, e-sourcing, e-tendering, e-reverse auctioning/e-auctioning and e-informing (de Boer et al.,2002). Some of the benefits of adopting e-procurement include savings in purchasing transaction cost resulting from less paperwork, less mistakes and more efficient purchasing process (Croom and Brandon-Jones, 2007).

1.1 Public Sector Procurement in Ghana

Ghana's Public Procurement Act, 2003 (Act 663) received presidential accent on December 31st 2003 and became operational on January 1st 2004.The coming into force of this Act formerly repealed and consolidated the multiple procurement related legislations in Ghana such as the District Tender Board Regulations, 1995 (L.I.1606), the Ghana National Procurement Agency Decree 1976 (SMCD 55) and the Ghana Supply Commission Law, 1990, PNDCL 245. Public Procurement is defined under this Act as 'the acquisition of goods, works and services at the

best possible total cost of ownership, in the right quantity and quality, at the right time, in the right place for the direct benefit or use of governments, corporations, or individuals, generally via a contract' (PPA Module, 2007). In other words, Public Procurement is the process by which organizations acquire goods, works and services using public funds. It is a comprehensive process that takes into account proper procurement planning, budgetary allocation, bids invitation, bids evaluation, award of contract, contract management, performance measurement, monitoring, auditing and reporting(Ghana,2003). (Arrowsmith et al., 2000) defines it as the acquisition of goods and services and hiring of contractors and consultants to carry out works and services. Public sector procurement refers to procurement by or on behalf of ministries, departments of central government, organs of local government and state corporations Procurement in the public sector aims to achieve multiple objectives. These include: economy, efficiency, fairness (i.e. nondiscrimination among potential suppliers), accountability, transparency and, where more than one country is involved, respect for international obligations (Odhiambo & Kamau, 2003). Besides its business objectives, public procurement is an instrument for the attainment of broader national socio-economic objectives such as supporting employment of citizens and income creation through preference for local suppliers; promotion of indigenous small, medium and micro enterprises (SMMEs); and, enhancement of regional integration through improvement of cross-border trade.

There is emerging evidence on the realities of e-procurement and some of the difficulties which adoption entails (Angeles and Nath, 2007). A number of recent studies have also looked into difficulties faced by firms in launching e-procurement. In a recent survey of 102 international active e-marketplaces and procurement service providers, Kheng and Al-Hawandeh (2002) investigated the adoption of e-procurement in Singapore and presented stumbling blocks to this initiative from the point of view of Singaporean firms. First, there were issues about security and privacy of procurement transaction data. Second, required significant investments in hardware, software, and personnel training to participate in e-procurement are prohibitive. Third, the laws governing B2B commerce, crossing over to e-procurement, are still undeveloped. For instance, questions concerning the legality and force of e-mail contracts, role of electronic signatures, and application of copyright laws to electronically copied documents are still unresolved. Fourth, technical difficulties related to information and data exchange and conversion such as inefficiencies in locating information over the internet using search engines and the lack of common standards that get in the way of the easy integration of electronic catalogs from multiple suppliers. The current literature is mainly founded on the private sector and a few founded on the local public sector. The basis of this study is therefore primarily founded on some of the challenges captured in the existing literature seeking to assess the actual and planned levels of e-procurement adoption, with the view of carrying out detailed study on the challenges of adoption of e-procurement in some Public Institutions in Ghana.

1.2 Objectives of the Study

The general objective of this study is to investigate the perceived challenges of e-procurement adoption in some Public Institutions in Ghana.

1.3 Specific Objectives

i. To determine whether lack of employee competency is a challenge in e-procurement adoption among Some Public Institutions.
ii. To investigate whether inadequate legal framework is a challenge in e-procurement adoption among Some Public Institutions.
iii. To establish whether inadequate technological infrastructure is a challenge in e-procurement adoption among Some Public Institutions.

To investigate whether concerns about security of procurement transaction data is a challenge in e-procurement adoption among Some Public Institutions..

2.0 LITERATURE REVIEW

This study's theoretical framework draws on Croom and Brandon-Jones (2007), which is found useful to understand key challenges of e-procurement implementation in government sector. Their work presents evaluation of e-procurement implementation and operation from an 18-month study of e-procurement deployment across nine UK public sector organizations. The article explores key themes in e-procurement, namely system specification and implementation management. They explore the dynamics of e-procurement processes in an organization and the transformational effect of e-procurement deployment. In fact tendering is one of the aspects of the procurement process where information technology is useful. Tendering electronically can empower procurement professionals with the means to take more control over the elements of tendering, providing improved and secure access to tender information. E-procurement is viewed as "the value-added application of e-Commerce solutions to facilitate, integrate and streamline the entire procurement process – all the way from initial strategy development through contract placement to payment" (Laub 2001, Williams & Hardy,2006).

Awareness about e-tendering is an essential factor in promoting widespread acceptance and usage of e-tendering as a better alternative to the traditional paper-based process (Oyediran & Akintola, 2011).Most

developing and developed countries governments would like to implement public e-procurement technology in such a way, as to enhance transparency and accountability in government procurement processes. The basic principle of the government procurement is straightforward: to acquire the right item at the right time with the right price (Neupane et al., 2012). Procurement is an important and expensive business activity for organizations, because organizations usually spend a large portion (even up to 70%) of their revenue/operational budget on purchasing goods and services. A number of public sector agencies worldwide have identified E-Procurement as a priority for e-Government agenda and have implemented or are in the process of implementing buy-side E-Procurement systems. However, the scholarly evaluation of E- Procurement initiatives, especially in relation to the use of Critical Success Factors (CSFs) in E-Procurement is very limited. A review of E-Procurement literature, primarily from the last five years, shows a lack of core constructs around CSFs. The reason for this might be that implementation of E-Procurement initiatives in the public sector is still in the early stages (Uddin, 2015). Since the emergence of this miraculous technological tool (e-procurement) scholars have explored the varied shapes and types of e-procurement. For instance, Neupane, Soar, Vaidya, and Yong in 2012 categorised e-procurement systems as tabulated below.

Table 1: Categorisation of e-procurement systems

E-procurement system	Description	Authors(S) & Year
e-Informing	Gathering and distributing purchasing information both from and to internal and external parties using internet technology.	(Boer,Harink & Heijboer, 2001; De Boer,Harink & Heijboer, 2002; Essig & Arnold, 2001)
e-Sourcing	Process of identifying new suppliers for specific categories of purchasing requirements using internet technology.	(De Boer et al., 2002; Fuks,Kawa & Wieczerzycki, 2009; Knudsen, 2003)
e-Tendering	The process of sending requests for information and prices to suppliers and receiving the response using internet technology.	(Betts et al., 2010; De Boer et al., 2002)
e-Reverse auctioning	Internet based reverse auction technology which focuses on the price of the goods and services auctioned.	(Carter et al., 2004; Teich,Wallenius & Wallenius, 1999)
e-MRO and Web based ERP	The process of creating and approving purchasing requisitions, placing purchase orders and receiving the goods or services ordered via a software system based on internet technology, e-MRO deals with indirect items (MRO), and web-based ERP deals with product-related items.	(Bruno et al., 2005; De Boer et al., 2002; Fink, 2006; Gunasekaran et al., 2009)
e-Ordering	The use of Internet to facilitate operationalization of the purchasing processes, including ordering (requisitioning), order approval, order receipt and payment process.	(Harink, 2003; Reunis,Santema & Harink, 2006)
e-Markets	E-markets are meeting venues for component suppliers and purchasers, who use exchange mechanism to electronically support the procurement process.	(Block & Neumann, 2008; Fuks et al., 2009)
e-Intelligence	Management information system with expenditure analysis tools	(Eakin, 2003; Harink, 2003)
e-Contract Management	The use of information technology for improving the efficiency and effectiveness of contracting processes of companies.	(Angelov & Grefen, 2008; Yang & Zhang, 2009

Source: (Adopted from Neupane et al., 2012)

Despite the numerous benefits of e-procurement public procurement entities continue to face challenges. These challenges may exist at the organizational level while executing public procurement. Although these challenges may be addressed through e- procurement, however adoption of e-procurement itself may have been a challenge.

2.1 Lack of Employee Competency

Governments in many countries are making conscious efforts to migrate their procurement activities towards E-procurement platforms; however, there remain a shortage of knowledge of the actual adoption of e-procurement experiences in the public sector (As-Saber & Rahim, 2011). To derive the accompanying benefits entailed in e-procurement adoption procurement staff must be competent enough to use the applications of software that offers the organization management skills to manage their activities for example, distribution chain and value addition in a company (Beth et al. 2003). This technology is based on databases, which are easily reached on real time

foundations. ERP systems perfectly provide the procurement management and the management itself with the opportunity to produce steadfast, consistent, and timely information necessary for attainment of organizational goals. According to Banda (2009) and Barsemoi et al., (2014) many procurement entities do not have competent human resource critical to manage procurement processes. The absence of the right calibre of employees to bring about enforcement of Quality standards, monitor e-procurement processes, determination of specifications, defining requirements, conducting supervisory roles eventually culminate to cause shortages in government budgets. Mbeche et al., (2014) argued that skills and knowledge of employees influence the future adoption of a new technology. They further argued that implementing e-procurement necessitates knowledgeable and skilled employees, therefore, the conspicuous lack of such personnel has attributed to delay in e-procurement adoption in most public institutions. Literature has established that there exist a direct correlation between an institution's capacity to explore new technology and its pool of human resources. A feasibility study on implementation of full e-procurement in Tanzania pointed out some key issues including readiness of existing legislative framework, Information and Communication Technologies (ICTs), infrastructure and People (Sijaona, 2010 and Mchopa, 2015). For an effective and efficient computer based procurement to be adopted there is the need for the maintenance of employee competence by ensuring that they are trained on related issues so that they can appreciate the legal frameworks and networks of their suppliers in the conduct of their business (Muguro, 2014).

In 2003, a note in Harvard Business Review indicated that `…despite years of process breakthroughs and elegant technology solutions, an agile, adaptive supply chain remains an elusive goal. Maybe it's the people who are getting in the way' (Beth et al. 2003). It is commonly believed that instead of considering the supply chain to be a 50/50 mix of infrastructure and information systems technology, rather any supply chain is more like 45/45/10 mix of human behavior, systems technology and asset infrastructure (Gattorna, 2006).

Andraski and Novack (1996) indicated that people are "… the most important element of the logistics marketing concept." Daugherty et al. (2000) noted: "To take supply chain performance to the next level, companies will have to tap into this human element more intensively. Many companies have pushed hard on technological and infrastructural improvements and investments. The next wave of improvements and investment should center on the people who manage and operate the supply chain."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 (World Bank, 2003). End-users can realize the immediate benefits of the e-Procurement system once they understand the operational functionalities (CGEC, 2002). 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 (ECOM, 2002). It is evident that employees has a great role in adoption of e-procurement and their skills ,competencies and training may influence to a large extent how e-procurement is adopted and implemented in an organization. The human element in a business environment cannot be overemphasized because without which, any organizational objectives such as e-procurement may not successful.

2.2 Inadequacy of Legal Framework

Legal framework is a basis of any business transaction whether in Public sector or private businesses. It defines the obligations and responsibilities of the partners transacting business with the objectives of fulfilling each other's desired goals. Kheng and Al-Hawandeh (2002) found that the laws governing B2B commerce, crossing over to e-procurement, are still undeveloped. For instance, questions concerning the legality and force of e-mail contracts, role of electronic signatures, and application of copyright laws to electronically copied documents are still unresolved.

The Public Procurement Authority recognize that the existing PPA 2005 and PPDR 2006 legal framework in Ghana may not have adequately covered aspects of e-procurement transaction.(PPA., The long term policy framework for Public Procurement 2009). The weakness in this frame work therefore may inhibit the adoption and growth of e-procurement iniatives. Understanding the challenges and limitation of e-procurement adoption in the public sector is important due to complexities of government policies and bureaucracy. Without such understanding, government may not be able to achieve the benefits of e-procurement. This could assist in future planning and adoption of e-procurement.

In an effort to create order in public procurement, PPA through the support of the Ghana Government and the Public Financial Management Reform (PFMR) Programme, has since its establishment in 2007 endeavoured to implement a new legal and regulatory regime to guide public procurement. Key achievement towards implementing a new legal and regulatory framework in public procurement is evident in the many guidelines PPA has developed to guide procurement practices and pricing of common user items. The guidelines include Public Procurement Market Price Index, General and Disposal Manual, Procurement Manual for Works, Procurement Manual for Information and Communication Technology, Procurement Manual for Insurance Services, Procurement Manual for Non- Intellectual Services, among others

Since coming into being, PPA has conducted procurement assessments and reviews in about 100 major

procuring entities. The principal goal of the reviews has been to help entities develop capacity building programs which enable them better apply the provisions of the Act and the Regulations. Procurement Assessments, on the other hand, have been carried out to check the level of performance of the procurement function in the selected entities to establish their strengths, weaknesses and areas that require assistance and improvement.

2.3 Inadequate Technological Infrastructure

Issues concerning information systems development and adoption are central to the e-procurement issue. Rajkumar (2001) identified systems integration as a critical success factor for e-procurement implementation, both with the customer's information infrastructure and in its links to suppliers. In an earlier study, Croom (2001) surveyed the adoption pattern of IOS. It was not surprising that email, web sites, funds transfer and EDI dominated the list. Email and web sites are dominant and ubiquitous systems, whilst major banks provide support for electronic funds transfer which provides a secure, low cost means of payment. EDI on the other hand is only cost effective for high volume transaction and communication between common trading hierarchies.

Often, EDI is deployed for the management of direct supply chains, i.e. for components and materials in manufacturing, or saleable products in retailing. The cost per unit is then relatively low, the benefits of high speed transmission and the sunk cost of investment are all factors which are seen as likely to sustain EDI, or at least integrate it into an Internet- EDI structure for the management of specific high frequency exchange supply chains. A recent commercial report by IDC (2003) demonstrated that there remained a slow uptake of e-procurement systems, emphasizing that system infrastructure-related issues such as software integration (including discussion of XML related opportunities) were inhibiting implementation. Kheng and Al-Hawandeh (2002) investigated the adoption of e-procurement in Singapore and presented stumbling blocks to this initiative from the point of view of Singaporean firms and that significant investment in hardware, software, and personnel training to participate in e-procurement are prohibitive.

Technological infrastructure plays a key role in adoption of e-procurement without which integration of public procurement entities will not materialize. Government departments have different levels of technological infrastructure, against this backdrop this study will seek to determine the role and impact of this factor in adoption of e-procurement. Suppliers on the other hand are at different levels of infrastructure development and this play a great role in understanding how this multiple level of technological infrastructure is integrated to facilitate adoption of e-procurement. Understanding of the different levels of infrastructure in public procurement entities and suppliers would help government to quantify the amount of investment in software and hardware to be channeled into adoption of e-procurement.

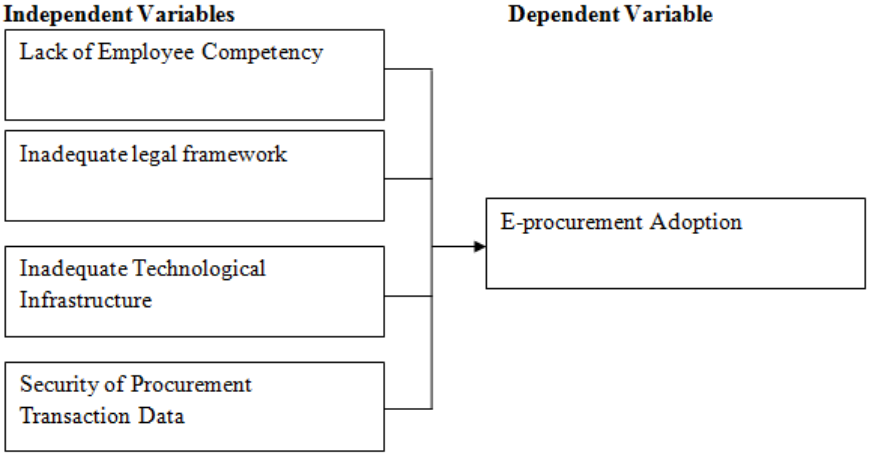
2.4 Security of Procurement Transaction Data

A number of recent studies have also looked into difficulties faced by firms in launching e-procurement. In a recent survey of 102 international active e-marketplaces and procurement service providers, Huber et al. (2004) found that concerns over security and confidentiality of the data needed to be exchanged in electronic environments was perceived as among the barriers to implementation of electronic procurement.

Saeed and Leith (2003) examined buyers' perceptions of e-procurement risks and arrived at three dimensions: first transaction risks resulting from wrong products purchased due to incomplete or misleading information; Second security risks resulting from unauthorized penetration of trading platforms and failure to protect transaction related data while being transmitted or stored; and Third privacy risks arising from inappropriate information collection and information transparency. Yen and Ng (2002) found that both buyer and seller firms in their sample considered the lack of adequate security measures to protect data as one of the prohibitive and discouraging factors in implementation of e-procurement.

Individual end users and entire business units will naturally resist any change in business processes that poses uncertainty in security and privacy of their transactions. Organization s keep their business information secret as a protective mechanism to ward off competition and remain competitive in the business environment. Public sector organizations on the other hand have limits to the amount and nature of information to be shared with other third parties. The Public procurement legal framework in Ghana legislated on confidentiality of public procurement process. The use of web technology has brought a myriad of data security challenges in internet transactions because of cyber crimes .The growth of internet has nevertheless brought serious challenges to business due to data hacking, internet fraud, Cyber vandalism, and virus and malware attacks (Huber et al. 2004).

2.4.1 Conceptual Framework



Source: Author, 2012

2.5 Empirical Review

Research into the uptake and application of e-procurement has focused on a number of themes, as identified by Schoenherr & Tummala (2007) who noted that early research into e-procurement focused on EDI (Ramasehan, 1997), the automation of formerly manual to automated processes and the impact on the business environment (Orr, 2000).Articles appearing in 2001 dealt primarily with market transformation issues inherent in the electronic revolution, advantages of e-procurement, and recommendations and advice on successful implementations (Rajkumar, 2001).

From a sector perspective, Schoenherr & Tummala (2007) noted that a diverse range of sectors have been researched, however, it is interesting to note that only 13% of articles relate to the government sector. Alongside these general inhibitors a number of specific inhibitors have been identified which relate to a specific sector. For example Panayiotou et al (2004) has noted that the inhibiting factors affecting the adoption of e-procurement in the Greek public sector includes the complexity of goods/services procured, the need for transparency in procurement, the challenges posed by public policy and the regulatory and legal constraints faced by public sector organizations.

The literature (Henriksen & Mahnke, 2005) reveals that these barriers and requirements tend to increase within the public sector, mainly due the impact of different economic and social factors, which influence the public domain with respect to the private sector (Gichoya, 2005). These differences have resulted in a number of specific regulations and standards that have been developed for public e-Procurement: which requires that a bureaucratic procedure be followed due to the nature of the institutions involved and embraces audit, accountability and compliance standards with national and international rules to ensure supply competition and transparency in the awarding of contracts. Croom & Johnston (2003), in their research of e-procurement in the UK public sector estimate that savings of the order of 5 – 20% are achievable in the cost of materials, with savings of the order of 50 – 70% can be achieved in relation to administration. More recent research by Puschmann & Alt (2005), in the private sector, noted that the introduction of e-procurement resulted in administrative savings of the order of 50 – 80%, however, they conclude that this range of potential savings may not be applicable to other sectors (e.g. the public sector) given the difficulties in reducing staff numbers.

Another example of the diversity of opinions regarding the scale of potential e-procurement cost savings relates to inventory. For example, Min & Galle (2002) estimated that inventory could be reduced by 20 – 25% and that order cycle times could be reduced to 5 days. Presutti (2003) concurs with this level of potential savings by noting that sourcing cycle times could be reduced by 25 – 30%. However, Croom & Johnston (2003) suggest even greater savings in this area with processing times reduced from 5 days to 2 hours through the use of e-procurement.

3.0 METHODOLOGY

3.1 Research Design

The research adopted a mixed descriptive design to collect both quantitative and qualitative data that described the prospects and challenges in the adoption of e-procurement in Ghana public sector. This research study considered gathering consistent and accurate data, as such, the study adopted the descriptive survey approach. Descriptive case study aims at collecting information about people's attitudes, opinion, and behvaiour (Orodho, 2002).

3.2 Population

The target population for this study was the public sector in Ghana. However, the study was limited to the Ministry

of Finance in Ghana. The Ministry of Finance was of interest to this study since according to the report by Central Bureau of Statistics (2010) the Ministry has made great efforts to comply with e-government initiatives among them is e-procurement. The total population of the study comprised all the 16 institutions under the Ministry of Finance shown in table 2 below.

Table 2: Distribution of Total Population

State Institutions	Total
Controller and Accountant General Department	3
State Insurance Commission	3
Ghana Library Authority	3
Ghana National Petroleum Corporation	3
Public Procurement Authority	3
National Lotteries Authority	3
Ghana Commercial Bank	3
Ministry of Education	3
National Investment Bank	3
Ministry of Health	3
Ghana Publishing Corporation	3
Graphic Communication Group Limited	3
Commission on Human Rights & Admin. Justice	3
Economic and Organized Crime Unit	3
Electoral Commission	3
Ministry of Finance and Economic Planning	3
Total	48

3.3 Sample Size and Sampling Technique

This study adopted a stratified sampling technique where the study population was stratified into management and non- management strata. Then simple random was used to select a sample of three from each corporation's department of procurement. One from management and two non management staff was selected.

Table 3: Distribution of Sample

Banks	Management Staff	Non Management Staff	Total
Controller and Accountant General Department	1	1	2
State Insurance Commission	1	2	3
Ghana Library Association			0
Ghana National Petroleum Corporation	1	2	3
Public Procurement Authority	1	2	3
National Lotteries Authority	1	2	3
Ghana Commercial Bank	1	1	2
Ministry of Education	1	2	3
National Investment Bank	1	2	3
Ministry of Health			0
Ghana Publishing Corporation	1	2	3
Graphic Communication Group Limited	1	2	3
Commission on Human Rights and Administrative Justice	1	2	3
Economic and Organize Crime Office	1	1	2
Electoral Commission	1	2	3
Ministry of Finance and Economic Planning	1	2	3
Total	14	25	39

3.4 Data Collection instrument

Both primary and secondary data was used for the study. The research study used a questionnaire as a key instrument for primary data collection. Secondary data was obtained from relevant literature like journals, internet and books. The questionnaire used was structured (close ended) and unstructured (open ended) to elicit both implicit and explicit responses from the respondents for the analysis of the quantitative data and qualitative data respectively. Some of the close ended questions required a response on a five point Likert scale, showing to what extent each factor influences the adoption of internet Banking.

The questionnaire was organized into six sections. The first section dealt with demographic statistics such

as name, age, years of service of the employees. The other sections included questions from the four objectives. A covering letter was provided for the first page. One hundred and forty three questionnaires were distributed to respondents. To make high response rate, the researcher delivered questionnaires individually by making an appointment. As a strategy aimed at minimising the time it may take to carry out this exercise, the researcher proposed to adopt both self administered and drop and pick strategies in questionnaire administration.

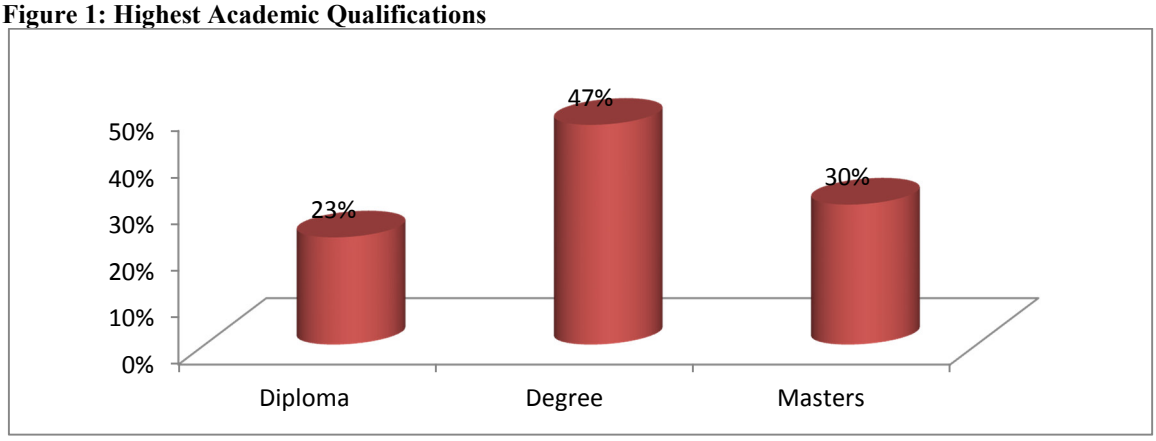
3.5 Data Analysis and Presentation

The questionnaires were first edited then coded to facilitate statistical analysis. Data collected was both qualitative and quantitative. Qualitative data was analyzed through content analysis. Quantitative data was analyzed using descriptive statistics with the help of Statistical Package for Social Science (SPSS) and the findings were presented in form of frequency distribution tables, bar charts and pie charts, mean scores and standard deviations. These analyses was used to address specific objectives I to IV. The data was summarized according to the study's specific objectives. In addition, to determine the level of significance between the independent variables and the dependent variable, thus one-way analysis of variance (ANOVA) tests were carried out.

4.0 DISCUSSION OF RESULTS

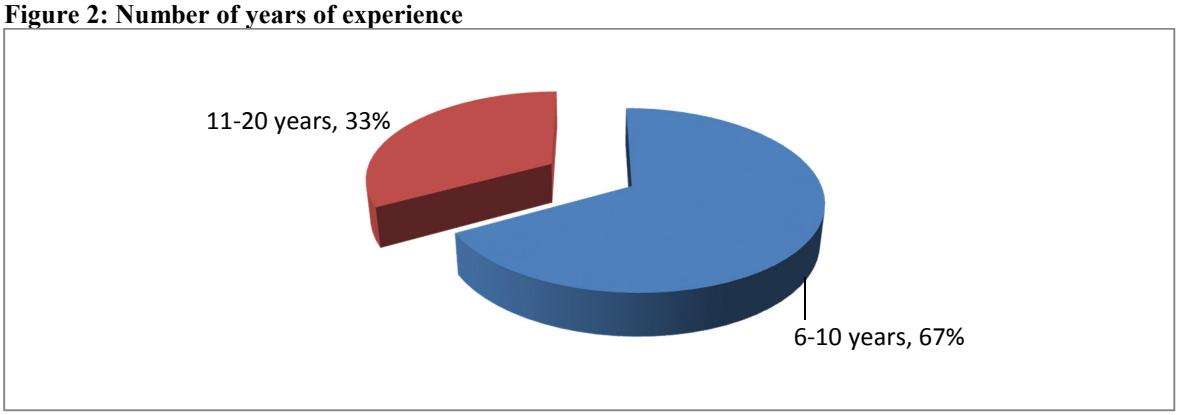
The results from the illustrations in figure 1 below, indicate that majority (47%) of respondents had undergraduate degrees while 30% had masters' degrees and 23% had diplomas as their highest level of education. This implies that the workforce is well qualified and knowledgeable in their various functions and was therefore in a position to offer credible information necessary for this study. Respondents were competent enough to implement e-procurement systems. This is shown in figure 1 below.

Figure 1: Highest Academic Qualifications



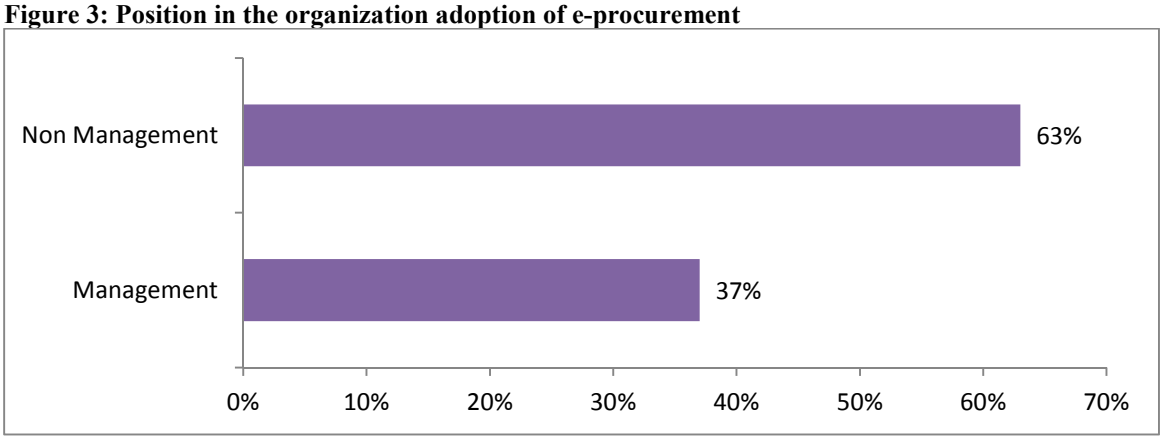
On the issue of the years of experience of the respondents it was clear from the findings that majority (67%) of the respondents had worked for between 6 and 10 years in their institutions while 33% had worked for between 11 and 20 years. The respondents have been in the organization long enough and therefore were in the position to provide accurate and reliable information for this study. In addition the experience provided a rich history about the individual institutions. This is shown in figure 2 below.

Figure 2: Number of years of experience



From figure 3 below it shows that Majority (63%) of the respondents were engaged in the performance of non- management functions, while 37% were in managerial positions. The interpretation here is that all the respondents were from the right target group thus understood the questions in the questionnaire, thus provided credible responses.

Figure 3: Position in the organization adoption of e-procurement



The results indicate 89% of these organizations had adopted e-procurement while 11% had not. This is illustrated in figure 4 below. Implying that, the level of consciousness of e-procurement adoption amongst these institutions was very high and for that matter they stood the chance of reaping the potential prospects of the e-procurement system.

Figure 4: Adoption of E-Procurement

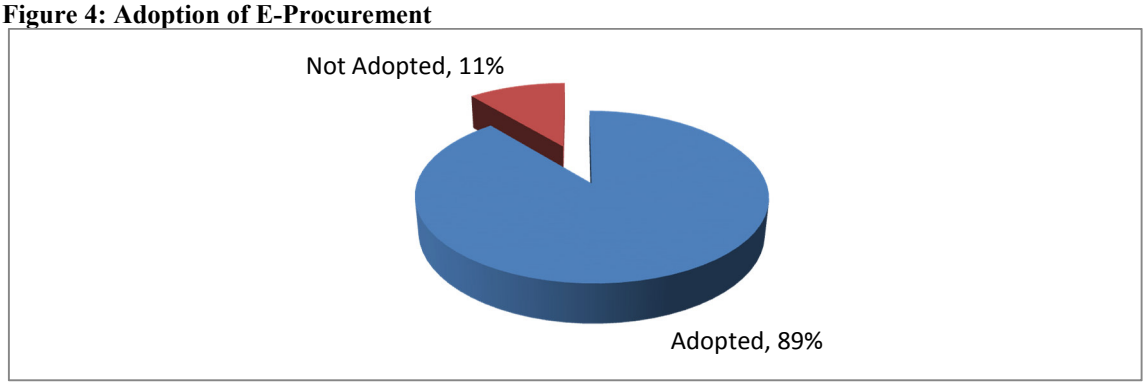
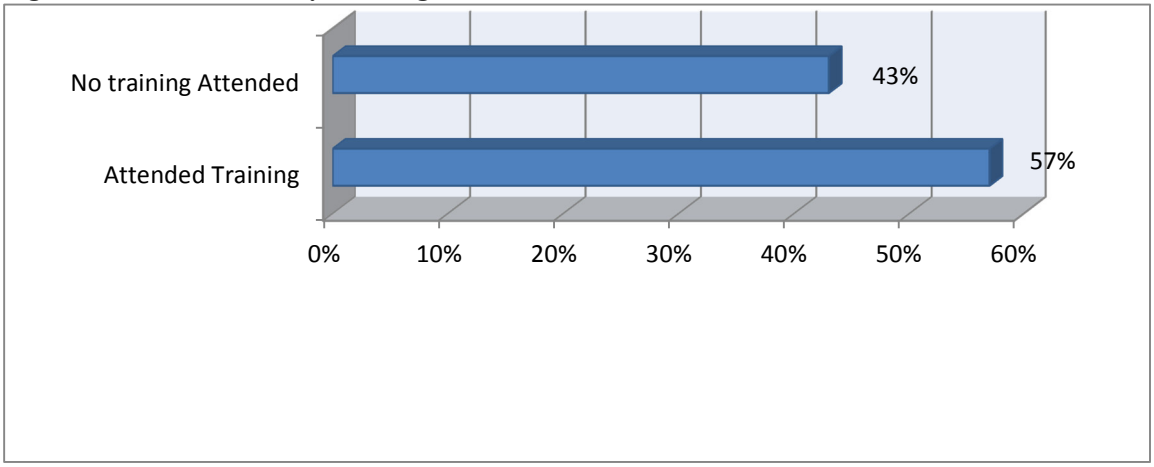
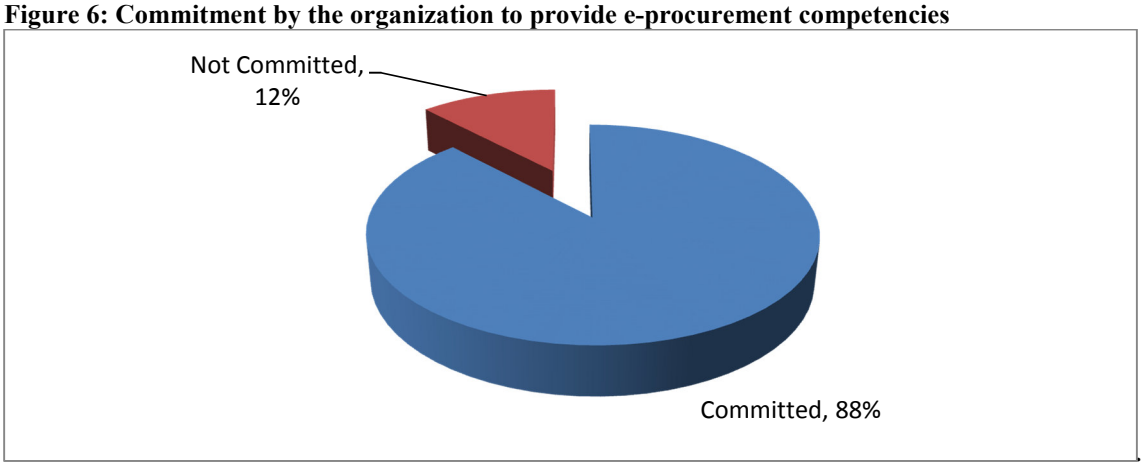


Figure 5: Attendance of any Training Related to E-Procurement



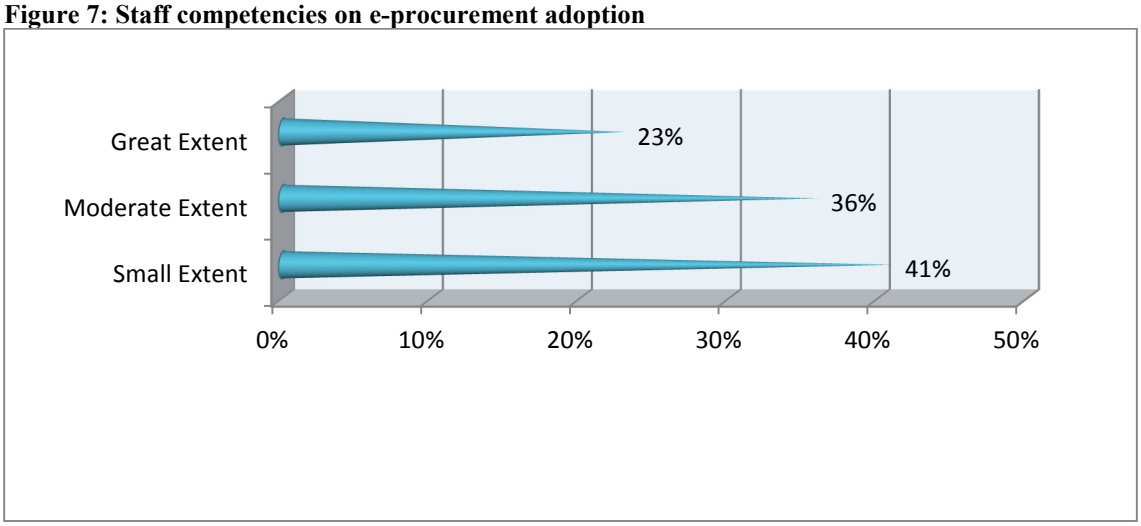
From figure 5 above, the results showed that majority (57%) of the respondents had attended e-procurement related training programmes, whilst 43% had not attended any training. For those who had attended training, all asserted that the training had impacted on them positively since they have been able to improve upon their skills on e-procurement. These findings were consistent with World Bank (2003) survey which argued that since 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 e-Procurement initiatives.

Figure 6: Commitment by the organization to provide e-procurement competencies



The results from figure 6 above showed that 88% of respondents consented their organizations were committed in the provision of e-procurement competencies and skills to their employees while 12% said there was no commitment to e-procurement skills development. According to CGEC, (2002), end-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 activities.

Figure 7: Staff competencies on e-procurement adoption



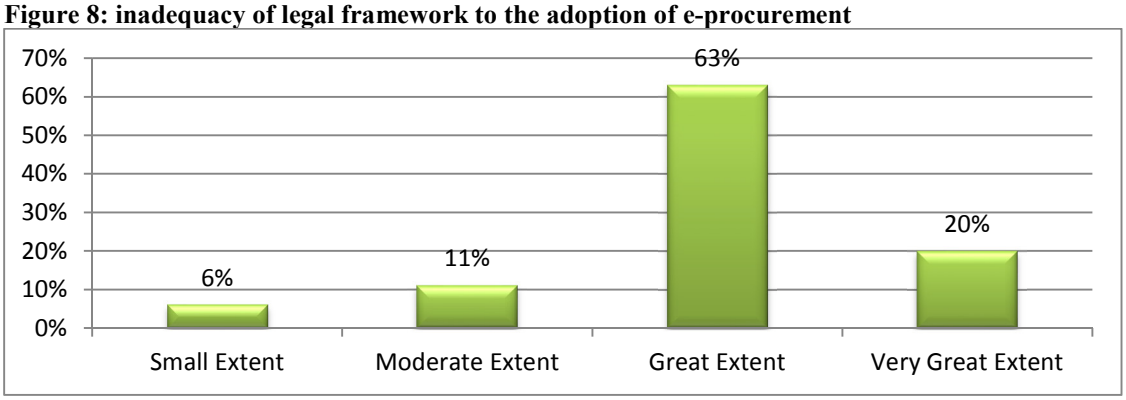
The respondents' opinion was sought on the extent to which staff competencies have been a hindrance to e-procurement adoption in their organizations. The findings did indicate that most (41%) of the respondents concurred that employee competencies, knowledge and skills had hindered e-procurement adoption to a small extent, 36% said it was to a moderate extent while 23% said it was to a great extent. This evidence is found in table 5 below detailing that respondents disagreed (mean=1.9855) that email contracts were legal in their organizations. They disagreed that electronic signatures were enforceable in their organization. Finally, majority disagreed (mean=2.2319) that PPA had adequately addressed the legality of e- procurement in the public sector. This assertion was in consonance with Kheng and Al-Hawandeh (2002) who postulated that the laws governing B2B commerce, crossing over to e-procurement, are still undeveloped. For instance, questions concerning the legality and force of e-mail contracts, role of electronic signatures, and application of copyright laws to electronically copied documents were still unresolved.

Table 5: Legal Framework Governing E-Procurement in Ghana

	N	Mean	Std. Deviation
E-mail contracts are legal	39	1.9855	1.12039
Electronic signatures are enforceable in the ministry	39	1.2391	.42811
Electronically copied documents are covered by the copyright laws	39	1.2754	.44832
PPA has adequately addressed the legality of e procurement in the public sector	39	2.2319	.93035

It is revealed from the findings illustrated in figure 8 that majority (63%) of respondents attributed inadequacy of a legal framework constitute to a great extent a challenge to e-procurement adoption in their organizations, whilst 20% indicated it was to a very great extent. The overwhelming evidence throws an enormous task thrown at the Public Procurement and Regulatory Authority to come to the realisation that the current PPA and PPRA 2006 legal framework in Ghana may not have adequately covered all aspects of e-procurement transactions. Hence, poses transactional risk to e-procurement practitioners and prospective organisations.

Figure 8: inadequacy of legal framework to the adoption of e-procurement



On the test item to measure the sufficiency of infrastructure supporting the adoption of e-procurement the findings as per figure 9 below, showed that majority (73%) of the respondents considered infrastructure supporting e-procurement insufficient, while 27% said they were sufficient. For those who considered the infrastructure insufficient, majority cited lack of fast internet speed and incompatibility issues encountered in an attempt to integrate the electronic system with other functional departments, such as the Finance Department and Human Resource Department. Respondents also cited non commitment from management to embrace e-procurement. These findings were consistent with the commercial report of IDC (2003) who demonstrated that there remained a slow uptake of e-procurement systems, emphasizing that system infrastructure-related issues such as software integration were inhibiting the smooth implementation of the e-procurement systems.

Figure 9: Sufficiency of Infrastructure Supporting E-Procurement

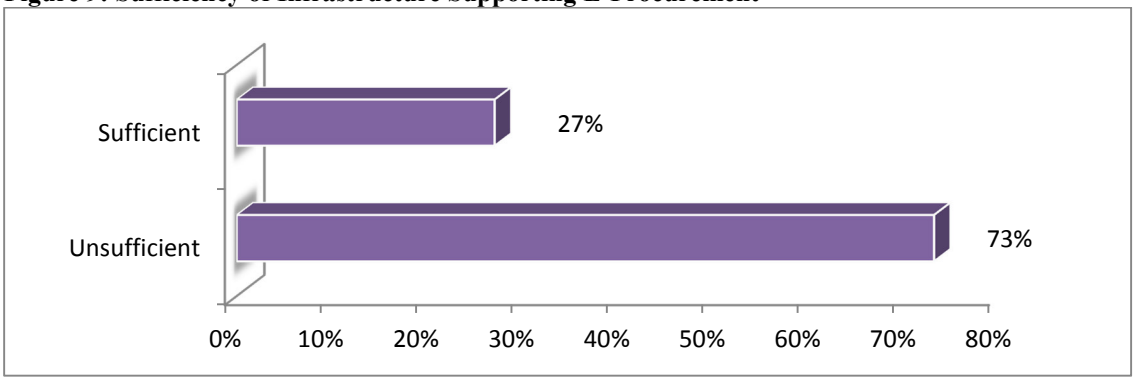
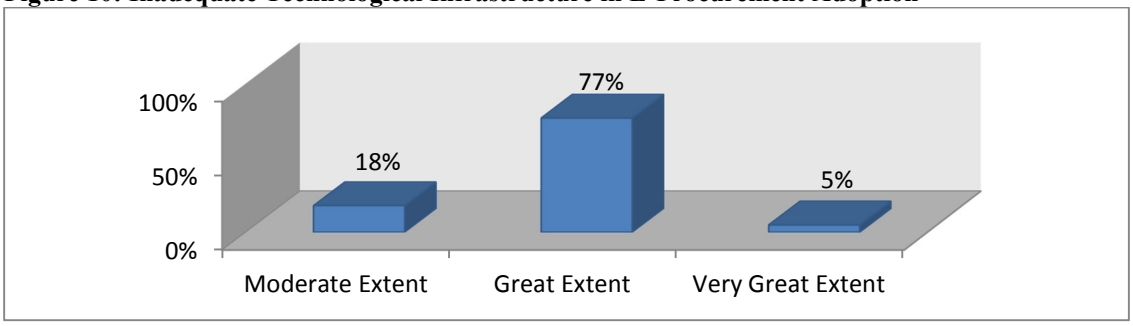


Figure 10 below shows the sufficiency of technological infrastructure for e-procurement adoption, the findings indicated that majority (77%) of the respondents alluded to the inadequate technological infrastructure, to have hindered e-procurement adoption to a great extent in their organizations. However, 18% said the challenge was to a moderate extent. In a drive to shift from paper-based transaction to an e-anabled transactional platform many of the organisations are confronted with huge technological deficiency resulting from laxity and the unwillingness on the part of management of these organisations.

Figure 10: Inadequate Technological Infrastructure in E-Procurement Adoption



From the results, majority of respondents said that transaction risks resulting from wrong products purchased due to incomplete or misleading information had a moderate effect (mean=2.6362) to e-procurement adoption. In addition, Security risks resulting from unauthorized penetration of trading platforms and failure to protect transaction related data while being transmitted or stored (mean=2.7899); Privacy risks arising from inappropriate information collection and information transparency (mean=3.087); Uncertainty over trust and

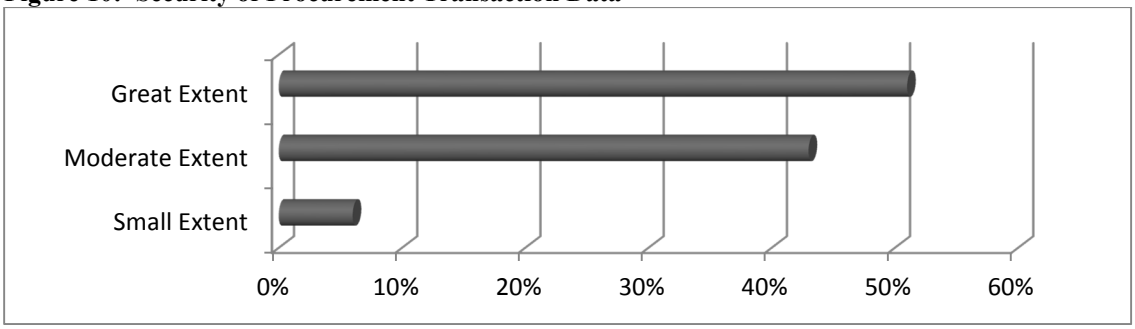
commitment among trading partners (mean=3.2754) and; Lack of standardization (mean=2.6618), all had a moderate effect on e-procurement adoption. These findings are similar to those of Huber et al. (2004).

Table 6: Factors Influencing E-Procurement Adoption

	N	Mean	Std. Deviation
Transaction risks resulting from wrong products purchased due to incomplete or misleading information	39	2.6362	.50050
Security risks resulting from unauthorized penetration of trading platforms and failure to protect transaction related data while being transmitted or stored	39	2.7899	1.16802
Privacy risks arising from inappropriate information collection and information transparency	39	3.0870	.68857
Uncertainty over trust and commitment among trading partners.	39	3.2754	1.26010
Lack of standardization	39	2.6618	1.04539

From the results, majority (51%) of the respondents said Security of Procurement Transaction Data was to a great extent a challenge to e-procurement adoption. However, 43% said it was to a moderate extent.

Figure 10: Security of Procurement Transaction Data



The descriptive table 7 below provides some descriptive statistics including the mean, standard deviation and 95% confidence intervals for the dependent variable (E-procurement Adoption), for each separate group (employee competency, inadequate legal framework, inadequate technological infrastructure and security of procurement data) as well as when all groups are combined (Total). From the results below, inadequate technological infrastructure came out as the greatest factor hindering e-procurement adoption (mean= 1.8264). The other factors in descending order were as follows; inadequate legal framework, Security of procurement transactions data and employee competence with means of 1.6324, 1.5312 and 1.4014 respectively. Issues concerning information systems development and adoption are central to the e-procurement issue. It can be deduced that the factors affecting the adoption of E-procurement are varied and different in nature. The institutions under review are poised for the establishment of the electronic procurement system but are handicapped by the aforementioned factors therefore pragmatic measures must be taken by the MoF to nib in the bud the teething challenges and paving the way for the smooth implementation and subsequent adoption of E-Procurement in Public Procurement within the Public institutions in Ghana.

Table 7: Descriptive table internet Banking adoption

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Inadequate technological infrastructure	15	1.8264	.48038 .3985	.09245	1.4766	1.8567
Inadequate legal framework	10	1.6324		.07542	1.5421	1.8623
Security of procurement transactions data	8	1.5312	.50730	.12304	1.1509	1.6726
Employee competence	6	1.4014	.51355	.13725	1.2749	1.8679
Total	39	1.5793	.50285	.06098	1.4077	1.6511

Table 8 below shows the output of the ANOVA analysis and whether there was statistically significant difference between the group means. The significance level is 0.198, which is greater than 0.05. Therefore, statistically there is no significant difference in the mean between the dependent and the independent variables. In a summary, there was no statistically significant difference between groups as determined by one-way ANOVA ($p = .198$).

Table 8: ANOVA on Internet Banking Adoption

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.315	3	.432	1.766	.198
Within Groups	16.746	36	.244		
Total	16.941	39			

5.0 Conclusions and Policy Implications

It can be concluded that lack of employee competency has hindered smooth adoption of e-procurement in the public sector. Although majority of organizations were committed to e-procurement skills development, training is still not at 100%. It is evident that employees have a great role in adoption of e-procurement and their skills, competencies and training may influence to a large extent e-procurement adoption and implementation in the institutions under the Ministry of Finance.

Inadequate legal framework is a difficulty in the implementation of e-procurement in the public sector in Ghana. Although a new legal and regulatory framework in public procurement in Ghana has been developed, it has done little to enhance uptake of e-procurement in the public sector. In general, PPA has not so far adequately addressed the legality of e- procurement in the public sector.

Finally, inadequate technological infrastructure has also been identified as a hindrance since it plays a significant role in e-procurement adoption in terms of systems integration of the Public sector in Ghana. Equally security of procurement transaction data constitutes a major factor that hampered the adoption of e-procurement. Individual end users and entire business units will naturally resist any change in business processes that poses uncertainty in security and privacy of their transactions. Organizations keep their business information secret as a protective mechanism to ward off competition and remain competitive in the business environment. Public sector organizations on the other have limits to the amount and nature of information to be shared with other third parties. The balance between transparency, protection against unauthorized data disclosure, ensuring the authenticity of a data source and the impact of disclosure of procurement process remains hazy.

The study recommends that due to continuous turnover of employees, continuous training for the incoming staff is required, for those organizations that have already been ISO accredited, training is compulsory and should be implemented. This should cover e-procurement and therefore mitigate the effects of this barrier. Inadequate legal framework was a challenge to e-procurement adoption, formal recognition backed by legislation of the electronic procurement transactions should be encouraged to accelerate the rate of Implementation of the System within the public sector.

This paper recommends that there should be conscious efforts by management of these institutions to integrate organizations' system and those of the suppliers, demonstrating the positive impact of the system, and installing linkages between all Governments agencies. The study adds that due to the sensitivity of the government data and the legal nature of orders and payments, security of data is critical in e-procurement systems. The e-procurement 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.

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