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# CHALLENGES OF ADOPTION AND ACCEPTANCE OF E-PROCUREMENT ON SUPPLY CHAIN MANAGEMENT PRACTICES IN MULTINATIONAL COMPANIES IN THE OIL AND GAS INDUSTRY. (THE CASE OF DEVELOPING COUNTRIES - ENI OIL EXPLORATION COMPANY – GHANA)

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## ABSTRACT

Advancement in Information Technology has resulted to reliable electronic support services all business sectors worldwide. In order to achieve their strategic business objectives such as operational efficiencies, sustainability and profitability, many organizations have taken advantage of Information Technology by integrating e- procurement into supply chain support functions. For Hasan & Abidin, (2011), the emerging trend of reliance on electronic support services is as a result of global economic downturn.

**KEYWORDS:** E-Procurement on Supply Chain Management Practices in Multinational Companies

## 1. INTRODUCTION

### 1.1. Background of the Study

According to Alban (2012), companies are adopting e-procurement because, the manual system of procurement in the supply chain of many companies over the world has been confronted with many challenges, characterized with bureaucratic paper-based processes, inability to track cost, or justify cost and companies are not able to know what they are buying on weekly basis. In response to this, several Multinational oil companies seems to have introduced e-procurement into their supply chain management. Many benefits have been reported as achieved, or expected, in e-procurement adoption. However, evidence is still lacking pertaining to the challenges of the adoption of e – procurement by firms operating in developing countries like Ghana.

This study therefore seeks at addressing this gap in the literature by investigating the challenges of adoption of e-procurement by multinational companies. ENI Oil Exploration Company Limited in Ghana is used as a case study.

### 1.2. Objective of the Study

The main objective of this study is to establish the challenges of adoption and acceptance of e-procurement on supply chain management. Specifically, the study seeks to;

- Determine factors considered in the procurement planning phase at ENI Oil Exploration Company.
- Establish factors that influence the adoption of e-procurement in ENI Oil Exploration Company.

- Find the challenges involved in adopting e-procurement

### 1.3. Research Questions

- Which factors are considered in the procurement planning phase at ENI Oil Exploration Company?
- What factors influence the adoption of e-procurement in ENI Oil Exploration Company?
- What are the challenges involved in the adoption of e-procurement?'

## 2. LITERATURE REVIEW

### 2.1. Definition and Explanations on E-Procurement

#### 2.1.1. Procurement

Procurement is defined as the activities involved in obtaining material and services and managing their inflow into an organization toward the end user. It includes obtaining manufacturing supplies for an assembly line as well as obtaining paper and pencils for a bank. Most organizations and firms spend about one third of their income on purchasing, this makes procurement activities very essential to the performance and success of such organisations (Caldwell, 2009).

Procurement is also considered as the process of acquisition of goods or services required as raw material (direct procurement) or for operational purposes (indirect procurement) for a company or a person. The procurement process not only involves the purchasing of commodities but also adopting quality and quantity checks. Usually, suppliers are listed and pre-determined by the procuring company. This makes the process smoother, promoting a good business relationship between the buyer and the supplier (Lewis, 2009).

#### 2.1.2. Electronic Procurement (E-Procurement)

Oliveira and Amorim (2001) defined E-procurement as the process of electronically purchasing the goods and services needed for an organization´s operation. It is also a real time platform for business deals which provides great opportunity to cut costs, increase organizational efficiency, and improve customer service.

Raghavan and Prabhu (2004) referred E-procurement as the "electronic acquisition of goods and services including all processes from the identification of a need to purchase of products, to the payment for these purchases including post-contract/payment activities such as contract management, supplier management and development".

According to Meier & Stormer (2009), E-Procurement is the method which connects all the processes between companies and suppliers through electronic communication networks.

### 2.2. Overview of Supply Chain

Ballou (2004) says that Supply chain "refers to all those activities associated with the transformation and flow of goods and services, including their attendant information flows, from the sources of raw materials to end users." Shapiro (2001) further elaborated that a Supply chain comprises geographically dispersed facilities where raw material, intermediate products or finished products are acquired, transformed, stored or sold through transportation links that connect facilities along with products flow.

The facilities can be operated by the own company or by vendors, customers, third party providers or with other companies with which the company has business arrangements with. The link forms a chain within which all the parties

involved in the arrangement can easily share and transfer information.

Supply chain for a company involves all the activities related to supply of products or services to the end customer. The activities can be within the own company, but also outside the own company.

Supply chains require a multiplicity of relationships and numerous paths through which products and information travel. This is better reflected by the conceptual diagram of a supply chain in which the supply chain is a web or network of participants and resources. To gain maximum benefit from the supply chain, a company must dynamically draw upon its available internal capabilities and the external resources of its supply chain network to fulfil customer requirements.

This network of organizations, their facilities, and transportation linkages facilitate the procurement of materials, transformation of materials into desired products, and distribution of the products to customers (*Mattson, 2002)*, It is critical to understand that no two supply chains are exactly alike. An organization's supply chain structure and relationships will be influenced by its industry, geographic scope of activity, supply base, product variety, fulfilment methods, and demand patterns.

The term supply chain conjures up images of product or supply moving from suppliers to manufacturers, then to distributors, to retailers and to customers along a chain. It is important to visualize information, funds, and product flows along both directions of this chain. The term supply chain may also imply that only one player is involved at each stage. In reality, a manufacturer may receive material from several suppliers and then supply to several distributors as well. Thus, most supply chains are actually networks. It may be more accurate to use the term supply network or supply web to describe the structure of most supply chains. A typical supply chain network may involve a variety of stages which include; customers, retailers, wholesalers/distributors, manufacturers, component/raw material suppliers (Chopra, 2004).

### 2.3. Concept of E-Procurement

E-procurement involves the use of internet for convenient buying as a technology solution. It is strong enough to change the purchasing process due to its power to penetrate the whole steps which has been recognized by an organisation. E-procurement is broadly defined to include e-design at the specification development stage of the purchasing process, ending with the supply manager's efforts to evaluate and rate supplier performance. *As companies strive to provide* more value to customer by improving site performance and reducing costs, they are also turning their attention to the procurement process (Monczka, Hand Feild, & Trent, 2001).

This procurement process which serves as the interface between an organization and its suppliers used to be viewed as having little strategic importance (Pearson, Eliram, & Carter, 1996). However, the emergence of E-procurement has made organisations to realize how procurement activities significantly affect the operations of the organisation. The concept of E-procurement is not a new phenomenon since it is an advancement of the EDI systems used for procurement.

E-procurement has been identified as the most important element of e-business operational excellence for large corporations (Yin, 2001). An E-procurement technology is considered as any technology designed to facilitate the acquisition of goods by a commercial or a government organization over the internet. E-Procurement technologies including; E-procurement software, B2B (business-to-business) auctions, B2B market exchanges, and purchasing consortia can be successfully implemented by automating workflows, consolidating and leveraging organizational spending power through the internet. Future developments are expected to extend these technology models to create collaborative supply

chain management tools (Yin, 2001).

Not surprisingly, e-procurement technologies have been credited with providing significant benefits to companies who venture into them. These advantages include reducing administrative costs, shortening the order fulfilment cycle time, lowering inventory levels and the price paid for goods, and preparing organizations for increased technological collaboration and planning with business partners. The relevance of these advantages has also accounted for the rapid migration from the traditional to e- based procurement models.

**2.4. Types of E-Procurement**

There are many different classifications for e-procurement, however, they all consists of different applications (Knudsen, 2003). The critical difference of e-procurement compared to traditional procurement is that it allows individual employees to order goods and services directly from their own PCs through the web (Croom & Johnston 2003). A large number of different applications and systems of e-procurement are identified in the literature. de Boer et al. (2002) divide e-procurement into six forms: web-based ERP, e-MRO, e-sourcing, e-tendering, e-reverse auctioning and e-informing.

- Web-based ERP; ERP software packages (from vendors such as SAP AG, Oracle and the Sage Group) are designed to optimize the resource planning of an enterprise. In terms of the manufacturing process they can generate recommended purchasing schedules in order to achieve an ideal just-in-time (JIT) production cycle. One of the many features of ERP software is its ability to automatically generate purchases orders using the Bill of Materials for the finished product as a basis. Web-based ERP software can go one step further as well as generating purchase orders. It can forward them to suppliers in order to fully automate the procurement process. Based on the ideal manufacturing process laid out by the ERP software, these orders ensure that materials will be available in time to begin production at the ideal time. In addition to generating new purchase orders, ERP software can also issue reschedule notices to suppliers. Reschedule notices are supplementary orders that can either cancel, delay, speed up and alter the size of pending orders.

- E-MRO; ERP software can also generate and send purchase orders for maintenance, repair and operating supplies to enable the smooth running of the production process. When repairs are necessary to components of a production line, e-MRO orders can greatly reduce down time. E-MRO orders are of greatest benefit to automated production lines using numerical control machine tools. Many automated machine tools can run self-diagnostic programs, notifying an operator by SMS message to a cell phone in the event of components failure. In addition to a message to the operator, the tool can also use ERP software to generate an e-MRO order for replacement parts.

- E-sourcing; E-sourcing is the use of the internet for the identification of new suppliers for a category of purchasing requirements. Otherwise known as reverse auctioning, e-sourcing is a method by which enterprises can move their procurement process online in order to reach a larger number of suppliers than would be possible through usual channels. The major benefit of e-sourcing is the competitive aspect by which suppliers bid for projects. Suppliers submit bids along with various details of the service they promise to provide, and purchasers can pick and choose from the offers. While reverse auctions can be performed through traditional channels, many enterprises prefer using the internet as they can connect with a wider range of service providers than would be practical in the real world.

- E-informing; E-Procurement can be used for the simple job of exchanging purchasing information between buyers

and suppliers. Using internet technologies such as e-mail helps to make the process of accumulating a database of supplier information simpler than using traditional contact methods.

### 2.5. Existing Procurement Practices in Firms

In reviewing literature, the study identified that many private organisations have distinct procurement practices. In Ghana procurement activities undertaken by public organisations are guided by the Republic of Ghana Public Procurement Act, Act 663). However, many private organisations (especially SME's) often procure goods without strictly adhering to the provisions in the Procurement Act. This study adopts the procurement cycle to discuss the various procurement practices in organisations.

#### 2.5.1. Procurement Cycle

The procurement cycle is more or less a road map of the activities within procurement function. It establishes key activities required at every stage of the procurement process while at the same time providing a benchmark for the monitoring and evaluation of the process by procurement monitors and evaluators. The procurement cycle model emphasizes activities occurring within the entire supply chain and not just procurement as shown in. Though the Act did not stress on the storage and distribution functions of the supply chain, the law's emphasis on the disposal of stores, plant and equipment makes it imperative to include all activities of the supply chain. These procurement activities consist of the following: Planning, sourcing, contracting, contract management, storing, distribution, disposal and evaluation (Republic of Ghana Public Procurement Act, Act 663).

- **Procurement planning**

The procurement plan lays out the details of the procurement process, and the steps that will be required. The procurement plan should identify the following; goals and objectives of the procurement, potential service providers, contract duration, procurement approach, payment approach, scope of services required, contract monitoring and evaluation, tender format, tender evaluation, procurement schedule and cost estimate (Republic of Ghana Public Procurement Act, Act 663). Procurement plan is used to provide information about the purchase of goods and services, how vendors will be chosen, what kind(s) of contract(s) will be used, how vendors will be managed, and who will be involved at each stage of the process. This document should be approved by appropriate individuals before the actual procurement process begins. The Act provides for procurement planning activity under Part 3 section 21 which stipulates that;

- A procurement entity shall prepare a procurement plan to support its approved Programme and the plan shall indicate: (a) contract packages, (b) estimated cost of each package, (c) the procurement method (d) processing steps and time.
- A procurement entity shall submit to its tender committee not later than one month to the end of the financial year the procurement plan for the following year for approval.
- After budget approval and at quarterly intervals after that, each procurement entity shall submit an update of the procurement plan to the tender committee.
- The procurement entity shall send to the tender review board, procurement notices for contracts and procurement plans above the threshold stipulated in schedule 3 for publication in the public procurement bulletin.

- A procurement entity shall not divide a procurement order into parts or lower the value of a procurement order to avoid the application of the procedures for public procurement in this Act.

Hence, during the first phase of the procurement cycle, procurement requirements are specified by the user. The strategy to be used is decided including "make or buy" decisions; funding decisions are taken; the applicable rules and methods to use are considered and then a time table for procurement process prepared is prepared. However, it should be noted that most private organisations do not often comply with the provisions in the Act unlike public entities which are mandated by law to comply with all provisions in the Act.

### 2.5.2. Sourcing, Contracting and Contract Management

The sourcing phase in the procurement cycle follows from the selected method of procurement. Activities within this phase include pre-qualification of potential suppliers, preparation and issue of tender documents, requests for quotations or requests for proposals; evaluation of responses and the selection of the successful tenderer not forgetting the fact that negotiations may be required at this stage. A contract then follows where a formal contract document is drawn up using the agreed terms and conditions and signed by both parties. Simpler requirements may use a purchase order or where framework contracts exist, contracting may consist of a call-off order under the existing contract. The awarded contract must be managed to ensure that both the buyer and the supplier perform their contractual obligations. Activities here may include; expediting delivery, establishing letters of credit, making arrangements for receipt and installation of goods, verifying documentation and making payments. Work contracts on the other hand may require technical supervision by an engineer while contracts for consultancy services often require the direct participation of the buyer or client organization as is in the case of training, technical advice or feasibility studies (The Public Procurement Act, Act 663, 2003).

- **Storage, Distribution and Disposal**

Storage comes in when goods procured are not being used immediately and therefore the need to store them to ensure that no damage or loss occurs. The timely availability of goods can be very crucial to an organization's operations. Goods may require specialized storage facilities or may have very limited shelf life so the effective storage, handling and management of stock levels are important. Goods in storage need to be delivered to their final destination for usage according the requirements of the customer or end-user. Distribution may involve complex in-country supply chains with delivery to multiple regional stores facilities or end-user sites. There may also be the need to respond to varying user demands and to transport goods through difficult environments and terrain with very poor infrastructure (The Public Procurement Act, Act 663).

Furthermore, it should be noted that the basic objectives of good procurement are to procure the right quality of goods, works or services from a reliable supplier in the right quantity ensuring cost effectiveness. Procurement items are to be delivered at the right time, to the right place, in the right quantity and at the right price whilst achieving the lowest total cost. In the achievement of the objectives of a good procurement system the following factors are of utmost importance: professionalism; transparency; value for money; competitiveness and accountability. Other factors include fairness, efficiency and ethical approach to the conduct of procurement functions.

## 2.6. Factors Influencing the Adoption of E- Procurement

For any e-procurement initiative to be successful, there are a number of factors that an organization must critically consider. They include: user acceptance of new information system; information quality; trust; risk perception; early

supplier involvement; staff training; users and buyers; compliance with best practices; top management support; continuous measurement of the key benefits; re-designing affected business processes and actual selection of e-procurement solution.

User acceptance of new information system has a critical and profound impact on the overall usage and success of the system's adoption (Venkatesh et al., 2003). According to Davis (1993), user acceptance is often the pivotal factor determining the success or failure of information system. In similar vein, Pikkarainen, Karjaluoto & Pahnila (2004) contended that user acceptance and usage of a system defines the effectiveness or ineffectiveness of the system. Understanding the factors that influence user acceptance of information technology is undoubtedly of interest to both scholars and researchers in a variety of fields as well as procurers of technology for large organizations.

Another factor is information quality. Information quality is seen to capture the e-commerce (web) content issue. In the context of e-procurement success, web content should be personalized, complete, relevant, easy to understand and secure. E-procurement should be of good quality if one expects buyers or suppliers to initiate transactions via the internet and to return to the site on regular basis. There are three constructs that are posited in this service quality dimension which are trust, perceived risk and perceived ease of use. The importance of trust is elevated in e-commerce because of the high degree of uncertainty and risk present in most on-line transactions. The most common definition of trust is by Mayers, Davis & Schoorman, (1995) whereby trust is defined as the willingness of a party to be vulnerable to the actions of another party based on the expectations that the other party will perform a particular action important to the trustor. This trust is conceptualized in terms of trustor's beliefs in the trustee's (suppliers) ability, benevolence, and integrity as proposed by Mayer et al. (1995).

The level of risk perception is also a major determinant of the success of e-procurement technology. According to Ring and Van de Ven's (1994) classification, risks are both technology-driven, and thus derived from the underlying infrastructure (environmental risks), relational risk, and the trading partner (behavioral risks). It is iterated that behavioral uncertainty arises because web retailers (suppliers) have the chance to behave in an opportunistic manner by taking advantage of the distant and impersonal nature of e-procurement and the buyer's inability to monitor adequately all transactions. It is important for organizations to ensure that all the perceived risks are handled properly to ensure success of the e-procurement project (Mayer et al., 1995). E-Procurement success is closely related to early supplier involvement. It is important to demonstrate the proposed solution to the suppliers and discuss any necessary changes, issues, and concerns such as various options in developing and maintaining supplier catalogues (Birks et al., 2001). Suppliers should be educated on the e-Procurement benefits that can be provided to them through a process of consultation as early as possible in the project. The degree to which the success of e-Procurement initiative can be realized may be well related to the level of e-readiness of suppliers, and appropriate communication with suppliers.

Training of staff in procurement practices and the use of e-Procurement tools are critical to the success of an e-Procurement initiative (Birks et al, 2001). The staffs of an organization need to acquire the necessary skills that can enable them to operate effectively and efficiently while using the new e-procurement system. If staff is not adequately trained, they may not be able to own the e-procurement system and this may contribute to failure. The success of e-Procurement initiative depends on users and buyers making use of the new process and system. The solution must attract end users to view e-Procurement as the preferred means by which to purchase goods and services. The success of e-procurement also depends on communication to the users (Birks et al, 2001). The organization adopting an

e-procurement system must be able to communicate this information to the users. Distorted communication of information may lead to failure of the system. Birks et al, (2001) further suggests that developing an e-Procurement system in an open environment allows it to link to other systems for interoperability and simplifies the upgrading of the system.

Compliance with best practices equally leads to successful e-procurement. E-Procurement initiatives only deliver the planned benefits if the users and buyers make changes to the way they work, which requires championing the system and senior management sponsorship. The business case processes for e-Procurement include identifying drivers, understanding the starting point, benefits, approaches, affordability, risks, and benefit realization. To ensure achievement of the e-Procurement objectives, the adoption project should proceed, as far as possible, in alignment with the business case (Birks et al., 2001).

The executive management team is responsible for setting the vision and goals, bringing about collective commitment for change in process and organizational structures, and formulating the policies and strategies necessary to put an e-Procurement initiative in place (Birks et al, 2001). If the e-procurement system does not have the full support of the top management team, there is every reason for that project to fail. It is important to make sure that the top management has given full support for the adoption of e-procurement. Considerable attention and support should be provided by senior management to ensure that the procurement reform has been well understood in the agency or organisation.

### 2.7. Challenges Involved in the Adoption of E-Procurement

Smart (2010) identified that there are numerous obstacles associated with the implementation of E-procurement projects. In some cases the benefits of implementing an e-procurement solution have been hard to evaluate. Piotrowicz and Irani (2010) propose that companies should use various measuring methods in order to fully track and understand how benefits are distributed according to the level and area of their impact. Even though the benefits of adopting e-procurement solutions can be significant, there are some internal and external challenges and risks related to the adoption of e-procurement. Smart (2010) came to a conclusion that there has been a long term problem with identifying value from IT investments and in creating a case for IT introduction in general. This is why companies need a clear plan for implementing e-procurement technologies.

Kalakota and Robinson (2001) explained that before the implementation of e-procurement, a company must first clearly define the business problems its e-procurement solution is intended to address. Furthermore, before an e-procurement solution can be deployed, a company must undergo thorough procurement process reengineering. Automating an existing procurement process will only make matters worse (Kalakota and Robinson 2001). Puschamann and Alt (2005) recognize that in the successful practices, the redesigning of the procurement process is focused on; reduction or elimination of authorization stages, regulation of exceptions to a limited degree in the beginning, elimination of paper, integration of suppliers in the entire process chain, and consideration of the complete process from searching for goods through to invoicing.

A study by Angeles and Nath (2007) identified three important challenges to e-procurement implementation; lack of system integration and standardization issues, immaturity of e-procurement-based market services and end-user resistance, maverick buying and difficulty in integrating e-procurement with other systems.

Lack of system integration and standardization issues relates to the fact that e-procurement is still relatively new

business application and it is not easy to find benchmark reference models. Another challenge is software immaturity and the lack of certain key features like invoicing, payment reconciliation or managing of different geographical jurisdictions, tax structures, currencies etc. Also, companies need to be aware of the possible hidden costs related to implementation of e-procurement solutions, such as system integration, content aggregation and rationalization, catalog and search engine maintenance, supplier enablement, end-user training and procurement process re-engineering. These costs can easily exceed software licensing and maintenance cost by five to ten times (Angeles & Nath, 2007).

The second challenge relates to the immaturity of providers of e-procurement services and the lack of supplier preparation, and the resistance of solutions by end-users. In some cases the immature service providers may not be able to provide a complete suite of services, especially for more complex or advanced e-procurement implementation projects. The immaturity of suppliers and the lack of preparation is also a challenge for many companies. After all, suppliers need to learn how to generate catalogs, process electronic purchase orders, how to use invoicing mechanisms among other tasks (Angeles & Nath 2007). Davila et al. (2003) explained that including companies preferred suppliers to the project is very important since the success of e-procurement solutions relies on the network effect. The network effect becomes more effective when players of the project adopt the same technology. The other challenge relates to the resistance by end-users towards operating the e-procurement solution. To prevent this Angeles and Nath (2007) stated that companies should encourage using new e-procurement technologies through intensive training and educational sessions with end-users.

The third challenge is linked to the difficulty of changing purchasing-related behavior among the company's employees. Some companies find it difficult to eliminate maverick buying even after the implementation of e-procurement. This can be prevented by intensive end-user training and educational programs. Companies also need to be aware of the problems in integrating the e-procurement solution with other systems (Angleles & Nath 2007).

Davila et al. (2003) also identified four risks associated with adopting e-procurement technologies. The authors stressed that these risks need to be carefully addressed before these technologies are adopted. The risks include;

**Internal Business Risks:** Businesses have to be careful while integrating e-procurement technologies with other business applications such as accounting, human resources, accounts payable and cash management. Most companies already have invested heavily in these other applications and the integration of e-procurement should go as smoothly as possible, or it can jeopardize the reliability of organizational information.

**External Business Risk:** e-procurement solutions also need to be able to cooperate with suppliers through IT-infrastructure. For e-procurement solution to be successful, suppliers must be accessible through the Internet and provide catalogs to satisfy the needs of their customers. In some cases suppliers might lack the resources to meet the demands of customers in catalog developing and updating. Companies also need to develop mechanisms that provide the buyers with assurance that new suppliers meet the expectations and standards relating to supplier quality, service and delivery capabilities.

**Technology Risks:** Many companies are not sure whether e-procurement solution best suits the specific needs of their company or not. The lack of widely accepted standards blocks the integration of different e-procurement solutions across the supply chain. Davila (2003) explained that without widely accepted standards for coding, technical, and process specifications, adoption of e-procurement technologies will continue to be slow and will fail to deliver the promised benefits.

**E-Procurement Process Risks:** This risk relates to the security and control of the e-procurement process itself. Such issues can be related to data security and fraud prevention e.g. fake suppliers, fake bids etc.

### 2.8. Empirical Review

Mose (2013) and his fellow researchers examined the critical success factors and challenges in e-procurement adoption among large scale manufacturing firms in Nairobi, Kenya. Their research employed the use of a cross-sectional survey of 455 large manufacturing companies operating in Kenya. The study adopted a descriptive approach in trying to establish the factors that influence the success of e-procurement projects. The study revealed that different organizations use different approaches in the adoption of information systems. The study also indicated that the adoption of e-procurement systems among manufacturing firms can be at different levels due to; the number of years of operating, past experience, the success or failure in the implementation of such systems and the automation level of activities within the procurement unit. The study also indicated that commitment by senior managers, availability of e-procurement operations, the involvement of suppliers in e-procurement adoption, changing manual procedures in favor of e-procurement, designing new process for automation, acquiring e-procurement system competitively, competitive bidding, employee willingness to use e-procurement system, staff readiness to make e-procurement succeed, regular e-procurement performance measurement, observation of procurement guidelines, compliance with rules and regulations, system buyers trust, up to date procurement information and efficient risk management have been adopted by large scale manufacturing companies in Nairobi, Kenya. This indicates that these factors are critical in the success of e-procurement adoption among large scale manufacturing firms in Nairobi, Kenya.

Mahmudul & Tan (2012) also examined the driving forces and hindering factors of e-procurement in China and Bangladesh by using General Electric and BATA companies as focus companies. The authors employed qualitative multiple case studies method in the combination of interview and questionnaires with both cases to create the deep understanding of e-procurement implementation. Their study revealed that BATA stressed more on centralized control and management of e-procurement initiatives, clear accountability for buying in organizational structure, close collaboration with suppliers, information systems specialists with internet skills and top management involvement and support as critical success factors in the implementation of e-procurement.

Their study further revealed that there are some major problems for traditional MRO procurement such as heavy reliance on personal relationship instead of formal official relationship, poor performance data available, poorly understood measurement processes, inadequate information systems and so on. These problems make the process cost of MRO goods higher. MRO procurement is often managed in a decentralized way which increases the procurement cost. Under MRO procurement, companies often do not pay much attention on suppliers' management and the suppliers cannot be stable with them. It increases the risk as well as transaction.

## 3. RESEARCH METHODOLOGY

### 3.1. Research Design

This research designed employed for this research is the mixed approach: quantitative and qualitative approaches, Creswell (2002). This approach was adopted because it helped the researcher to provide more comprehensive answers to the research questions. The qualitative approach assessed the opinion of employees in ENI oil Exploration Company whiles the quantitative approach assessed adoption of E-procurement in the Company to establish any trends developing in

the supply chain of multinational companies.

### 3.2. Population and Sampling Procedures

The target population comprised of employees at the head office of ENI oil Exploration Company at Airport in the Greater Accra Region. The total staff strength at the head office of the company is forty (40). The purposive sampling method was adopted in selecting respondents for the study. This sampling method is a form of non-probability sampling in which decisions concerning the individual to be included in the sample are taken by the researcher, based upon a variety of criteria. Thus this technique, aids the researcher to select respondents who had certain knowledge (Ma, 2007) on procurement and supply chain in the sampled company. According to Ma (2007), purposive sampling technique is a practical and efficient tool which when used properly, can be just as effective as, and even more efficient than, random sampling.

A sample size of 37 was chosen for the study. This sample size relied on Taro,(1967) sample size formula shown; $n = \frac{N}{1+N(e)^2}$ Here, n= Sample size, N=Population and e= error margin=0.05% as well as confidence coefficient of 95% were considered, Polonia (2013).

$$n = \frac{40}{1 + 40(0.05)^2} = 36.4$$

From the calculation above, a sample size of thirty seven (37) respondents were considered for the study. This was deemed appropriate to represent the research population.

### 3.3. Sources of Data and Research Instrument

The data consisted of both primary and secondary data. The primary data was collected from the field at the head office of ENI Oil Exploration Company in Accra whiles the secondary data was collected from articles, books, journals, industry working paper, working paper and website of ENI Oil Exploration Company. Research instrument used to collect data was questionnaire.

## 4. DATA ANALYSIS AND DISCUSSIONS OF FINDINGS

### 4.0 INTRODUCTION

### 4.2.2. Factors Considered During Procurement Planning Phase

Concerning the factors considered by the firm during procurement planning phase, the responses obtained are gathered in table 4.3 below.

**Table 4.3: Factors Considered During the Procurement Planning Phase**

| Factors | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| Goals and objectives of the procurement | 16 | 53.3 | 53.3 |
| Potential service providers | 9 | 30.0 | 83.3 |
| Contract duration | 5 | 16.7 | 100.0 |
| **Total** | **30** | **100.0** | |

***Author's Computation from Field (2016)***

It can be discovered in table 4.3 that 53.3% respondents specified that ENI consider the goals and objectives of

the procurement during the planning phase, 30% respondents said ENI consider potential service providers, and the remaining 16.7% respondents mentioned contract duration.

It can be inferred that the modal response showed that the respondents mentioned the main factor considered during the planning phase as Goals and objectives of the procurement, followed by Potential service providers, and Contract duration. Similarly, Republic of Ghana Public Procurement Act, Act 663 also indicated that procurement plan should identify the goals and objectives of the procurement, potential service providers, contract duration, procurement approach, payment approach, scope of services required, contract monitoring and evaluation, tender format, tender evaluation, procurement schedule and cost estimate. This shows that that the company conforms to the Ghana procurement Act 663(2003 in its procurement planning phase.

### 4.2.4. Other Forms of Activities Checked During the Sourcing Phase

Regarding this, respondents were made to indicate whether other forms of activities are checked during the sourcing phase. Figure 4.2 below demonstrates the responses obtained from the respondents.

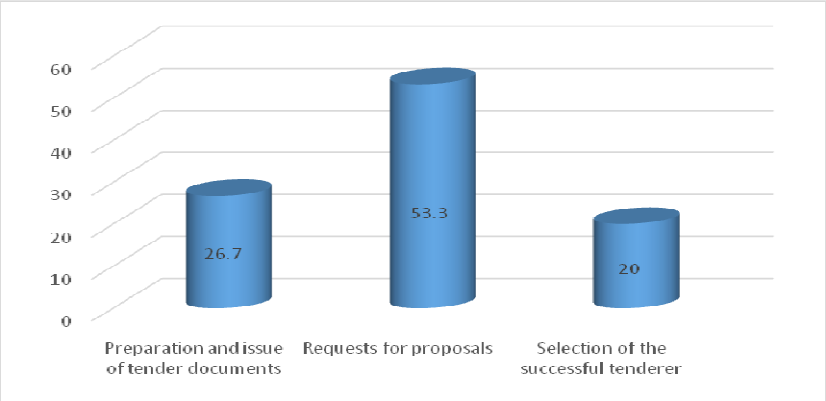


**Figure 4.2: Other Forms of Activities Checked During the Sourcing Phase**

***Author's Computation from Field (2016)***

Figure 4.2 illustrates that 26.7% respondents were of the notion that other forms of activities checked during the sourcing phase consist of the preparation and issue of tender documents, 53.3% respondents indicated request for proposals and 20% respondents specified 'selection of the successful tenderer'.

Hence, it can be established that other forms of activities checked during the sourcing phase comprised of request for proposals, Preparation and issue of tender documents, and 'selection of the successful tenderer'. These activities were also emphasized in the Ghana Procurement Act 663 as mostly required in the sourcing phase of E-procurement.

### 4.3.3. Risk Management and Success of E-Procurement Project

The research determined whether ENI ensure that all perceived risks are handled properly to ensure success of the e-procurement project in its supply chain. The respondents were given options such as Yes, No or Not Sure to confirm or denied this assertion. The responses are presented in figure 4.5 below.

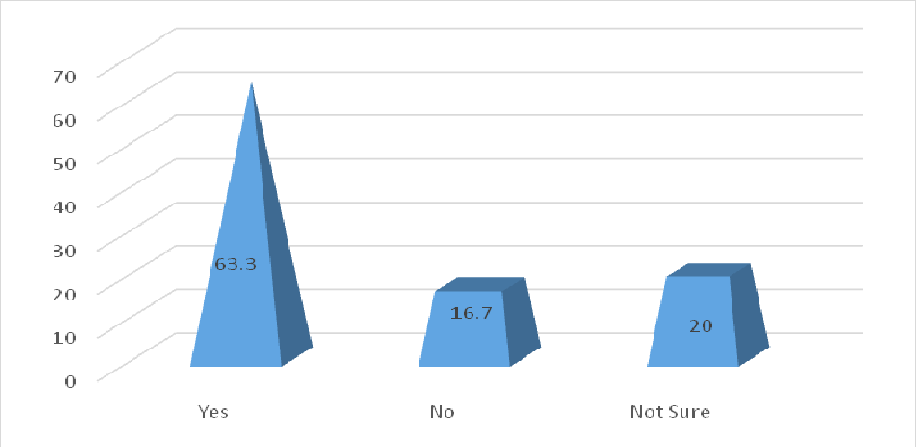


**Figure 4.5: Risk Management and the Success of E-Procurement Project**

***Author's Computation from Field (2016)***

63.3% respondents confirmed that ENI ensure that all perceived risks are handled properly to ensure success of the e-procurement project in its supply chain whiles 16.7% respondents denied this. On the contrary, 20% respondents were not sure as to whether ENI ensure that all perceived risks are handled properly to ensure success of the e-procurement project in its supply chain.

The modal response rate indicates that ENI actually ensure that all perceived risks are handled properly to ensure success of the e-procurement project in its supply chain. In a similar way, Mayer et al., (1995), asserted that it is important for organizations to ensure that all the perceived risks are handled properly to ensure success of the e-procurement project.

### 4.3.4. Success of E-Procurement and Frequent Communication

In relation to whether the success of e-procurement in ENI also depends on frequent communication to the users in its supply chain, the respondents were given options such as Yes, No or Not Sure to confirm or denied this assertion. Figure 4.6 below shows the findings discovered from the investigation.

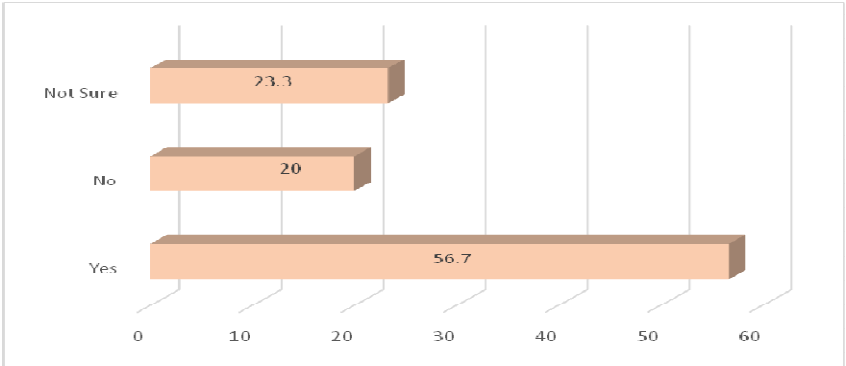


**Figure 4.6: Success of E-Procurement and Frequent Communication**

***Author's computation from field (2016)***

It was discovered in figure 4.6 above that 56.7% respondents attested that the success of e-procurement in ENI also depends on frequent communication to the users in its supply chain whiles 20% respondents denied this assertion. On the other hand, 23.3% respondents were not sure as to whether the success of e-procurement in ENI also depends on

frequent communication to the users in its supply chain.

It can therefore be deduced from the responses that majority of the respondents confirmed the success of e-procurement in ENI also depends on frequent communication to the users in its supply chain. This is the same as Birks et al, (2001) assertion that distorted communication of information may lead to failure of E-procurement system. This means that the degree to which the success of e-Procurement initiative can be achieved depends on appropriate communication with suppliers.

### 4.3.5. Setting the Goals and Strategies Required by Management

As to whether executive management team of ENI usually set the goals and strategies required for e-Procurement implementation in supply chain, figure 4.7 below illustrates the findings as investigated.

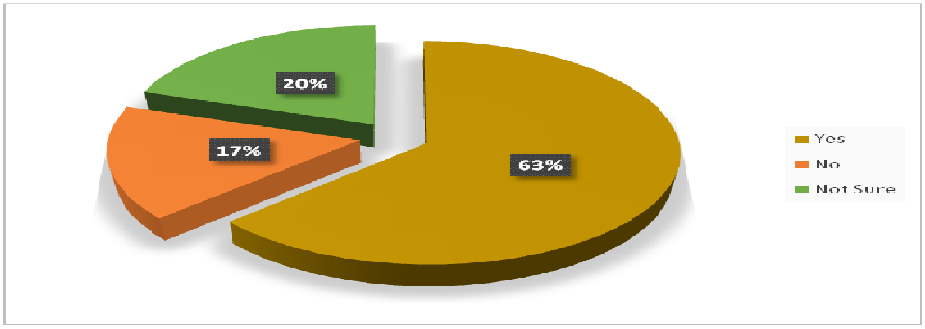


**Figure 4.7: Setting the Goals and Strategies Required by Management**

***Author's Computation from Field (2016)***

It was revealed that 63% respondents confirmed that executive management team of ENI usually set the goals and strategies required for e-Procurement implementation in supply chain and 17% respondents did not agreed to this. Furthermore, 20% respondents were not sure as to whether executive management team of ENI usually set the goals and strategies required for e-Procurement implementation in supply chain.

However, the modal response rate explains that executive management team of ENI usually set the goals and strategies required for e-Procurement implementation in supply chain. In line with this, Birks et al, (2001) emphasized that if the e-procurement system does not have the full support of the top management team, there is every reason for that project to fail.

## 4.4. Challenges Involved in the Adoption of E-Procurement

This section focuses on the major challenges in the adoption of e-procurement in its supply chain. Owing to this, the respondents were to rate given variables such as Lack of system integration and standardization issues, End-user resistance, Immaturity of e-procurement-based market services, difficulty of changing purchasing-related behaviour among company employees, Technology risks, E-procurement process risks, and External business risk. They were to indicate whether they strongly disagreed, disagreed, remained neutral, agreed, and strongly agreed. The findings are illustrated in table 4.7 and figure 4.8 below;

**Table 4.7: Challenges Involved in the Adoption of E-Procurement**

| Challenges In E-Procurement | Strongly Disagree (%) | Disagree (%) | Neutral (%) | Agree (%) | Strong Agree (%) |
|---|---|---|---|---|---|
| Lack of system integration and standardization issues | 10 | 13.3 | 10 | 33.3 | 33.3 |
| End-user resistance | 16.7 | 16.7 | 16.7 | 36.7 | 13.3 |
| Immaturity of e-procurement-based market services | 13.3 | 16.7 | 16.7 | 33.3 | 20 |
| Difficulty of changing purchasing-related behavior among the company's employees | 20 | 13.3 | 40 | 6.7 | 20 |
| Technology risks | 16.7 | 10 | 16.7 | 26.7 | 30 |
| E-procurement process risks | 13.3 | 46.7 | 6.7 | 20 | 13.3 |
| External business risk | 10 | 13.3 | 13.3 | 40 | 23.3 |

### 4.4.1. PERCENTAGE ANALYSIS OF CHALLENGES

**Author's Computation from Field (2016)**

Lack of system integration and standardization issues: Concerning this, 10% respondents strongly disagreed, 13.3% respondents disagreed, 10% respondents were neutral, 33.3% respondents agreed, and 33.3 respondents strongly agreed.

From the modal response, Lack of system integration and standardization is a challenge confronting the firm in the adoption of e-procurement in the companies supply chain.

End-user resistance: Regarding this, 16.7% respondents strongly disagreed, 16.7% respondents disagreed, 16.7% respondents were neutral, 36.7% respondents agreed, and 13.3% respondents strongly agreed. From the modal response, End-user resistance is another challenge faced in the adoption of e-procurement in the companies supply chain.

Immaturity of e-procurement-based market services: In lieu of this, 13.3% respondents strongly disagreed, 16.7% respondents disagreed, 16.7% respondents were neutral, 33.3% respondents agreed, and 20% respondents strongly agreed. This means that majority of respondents were of the view that Immaturity of e-procurement-based market services is another challenge faced in the adoption of e-procurement in the companies supply chain

Difficulty of changing purchasing-related behaviour among the company's employee: thus, 20% respondents strongly disagreed, 13.3% respondents disagreed, 40% respondents were neutral, 6.7% respondents agreed, and 20 respondents strongly agreed. This shows that majority of respondents remained neutral to this assertion that difficulty of changing purchasing-related behaviour among the company's employee is a constraint confronting the firm.

Technology risks: Regarding this, 16.7% respondents strongly disagreed, 10% respondents disagreed, 16.7% respondents were neutral, 26.7% respondents agreed, and 30% respondents strongly agreed. From the modal response, technology risks is another challenge faced in the adoption of e-procurement in the company's supply chain

E-procurement process risks: regarding this, 13.3% respondents strongly disagreed, 46.7% respondents disagreed, 6.7% respondents were neutral, 20% respondents agreed, and 13.3% respondents strongly agreed. Thus, E-procurement process risks is not a barrier confronted by the firm in the implementation of e-procurement in the company's supply chain

External business risk: concerning this, 16.7% respondents strongly disagreed, 10% respondents disagreed, 16.7% respondents were neutral, 26.7% respondents agreed, and 30% respondents strongly agreed. It can be inferred that, external

business risk is another challenge faced in the adoption of e-procurement in the company's supply chain practice.

### 4.4.2. Ranking of Challenges in E-Procurement

The challenges above were then ranked in order of reliance to ascertain the highest major challenge and the least challenges E-procurement. This is illustrated in figure 4.8 below.

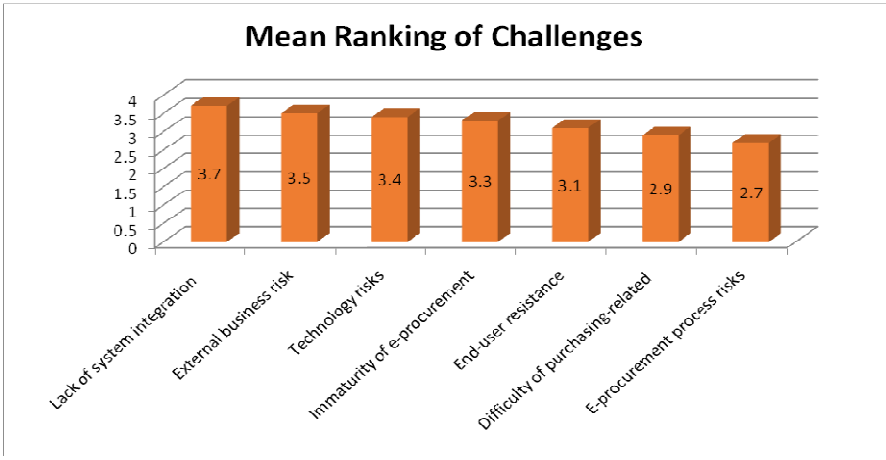


**Figure 4.8: Ranking of Challenges in E-Procurement**

**Author's Computation from Field (2016)**

Figure 4.8 demonstrates the mean ranking results. By observation, Lack of system integration and standardization issues was ranked as the first challenge with a score of 3.7, followed by External business risk with a score of 3.5, Technology risks with a score of 3.4, Immaturity of e-procurement-based market services with a score of 3.3, End-user resistance with a score of 3.1, difficulty of changing purchasing-related behaviour among the company's employees with a score of 2.9, and E-procurement process risks with a score of 2.7.

Similarly, a study by Angeles and Nath (2007) identified three important challenges to e-procurement implementation as lack of system integration and standardization issues, immaturity of e-procurement-based market services and end-user resistance, maverick buying and difficulty in integrating e-procurement with other systems.

## 5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

### 5.1. Summary of Findings

The study revealed that the main factors considered during procurement planning phase comprises of Goals and objectives of the procurement, Potential service providers, and Contract duration. Other activities undertaken during the procurement sourcing phase include issue of tender documents, pre-qualification of potential suppliers, requests for quotations, and selection of successful tenderer.

With reference to risk management and e-procurement supply chain project, the study found that all perceived risks are handled properly to ensure success of the e-procurement project. On the role that frequent communication plays in the success of e-procurement, the study concludes that the success of e-procurement depends on frequent communication to the users in its supply chain.

Regarding the challenges involved in the adoption of e-procurement, cumulatively, the mean ranking disclosed that Lack of system integration and standardization issues was ranked as the first challenge with a mean score of 3.6,

followed by External business risk with a mean score of 3.5333, Technology risks with a mean score of 3.4, Immaturity of e-procurement-based market services with a mean score of 3.3, End-user resistance with a mean score of 3.1, difficulty of changing purchasing-related behaviour among the company's employees with a mean score of 2.9, and E-procurement process risks with a mean score of 2.7.

## 5.2. CONCLUSIONS

It can be concluded that the procurement the main factors considered during procurement planning phase are goals and objectives of the procurement, potential service providers, and contract duration. Activities undertaken during the procurement sourcing phase include issue of tender documents, pre-qualification of potential suppliers, requests for quotations, and selection of successful tenderer.

The study concludes that perceived risks are handled properly to ensure success of the e-procurement project. Also frequent communication with users in the supply chain plays a role in the success of e-procurement.

Below are the challenges involved in the adoption of e-procurement. They are arranged in descending order: highest to lowest challenge:

- lack of system integration and standardization issues
- external business risk
- Technology risks
- immaturity of e-procurement-based market services
- end-user resistance
- difficulty of changing purchasing-related behaviour among the company's employees
- e-procurement process risks

## 5.3. RECOMMENDATIONS

In order for oil and gas companies to adopt e-procurement successfully, its recommended that they work hard at overcoming the challenges of system integration and standardization issues, external business risk, Technology risks and immaturity of e-procurement-based market services.

This study focussed on the oil and gas industry oil and the sample size used was also small: hence it would be difficult to generalise the findings from this study for companies in other industries or even for all oil and gas companies. It is therefore recommended that further studies be conducted using companies from more than one industry and also using a bigger sample size.

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