

**ELECTRONIC REVERSE AUCTIONS AND PROCUREMENT  
PERFORMANCE IN MULTINATIONAL  
PHARMACEUTICAL CORPORATIONS IN KENYA**

**BY**

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## DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any institution or university other than the University of Nairobi for examination.

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## **DEDICATION**

This research project is dedicated to my family: Kellan Majanga, Maureen Njeri, Christine Mmbone, Lillian Khanyeleli and Mark Okinyo for their unconditional support and encouragement during the entire period of my study.

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## **ABBREVIATIONS AND ACCRONYMS**

COMESA:	Common Markets of East and South Africa
E-RAs:	Electronic Reverse Auctions
ICT:	Information Communication Technology
IT:	Information Technology
MNCs:	Multinational Corporations
SMEs:	Small and Medium Enterprises
TAM:	Technology Acceptance Model
TTF:	Task-technology Fit
UNIDO:	United Nations Industrial Development Organization,
UTAUT:	Unified Theory of Acceptance and Use of Technology

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## ABSTRACT

This study aimed to establish the influence of electronic reverse auctions on procurement performance in multinational pharmaceutical corporations in Kenya. The study had three objectives namely, to establish the level of adoption of electronic reverse auction in the multinational pharmaceutical corporations in Kenya; to determine the relationship between electronic reverse auction and procurement performance in the multinational pharmaceutical corporations in Kenya and to find out the challenges faced in implementation of electronic reverse auctions by the multinational pharmaceutical corporations in Kenya. The methodology adopted was descriptive research design and primary data collected through questionnaires which were administered by electronic mails. The population was made up of all the 34 multinational pharmaceuticals corporations and two questionnaires were administered in each firm bringing a total number of respondents to 68 out of which 54 were completed and returned. Descriptive statistics was used in the analysis of objective one and three while objective two was analyzed through regression analysis. The findings show that access to global suppliers, competitive prices and having a level playing field were all adopted to a large extent by the multinational pharmaceutical corporations in Kenya. The adoption of access to global suppliers, competitive prices and having level playing fields were found to influence cost, timeliness and dependability. Generally, it was found that electronic reverse auctions influence procurement performance in the multinational pharmaceutical corporations in Kenya. Among the challenges faced in the implementation of electronic reverse auctions by the multinational pharmaceutical corporations include high initial cost of setting up, high cost of maintenance, lack of support from the top management, ICT illiteracy and disruptions due to technical hitches. The study recommends that multinational pharmaceutical corporations should highly invest in electronic reverse auction (large pool of suppliers, level playing field and competitive prices) if they are to enhance their procurement performance (cost, timeliness and dependability). Further studies should focus on the driving factors of implementing electronic reverse auctions by the multinational pharmaceutical corporations in Kenya.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the study

Most entities in competitive markets encounter difficulties in making money and surviving as they are not able to counter the continuous changes in the market (Yu, Yevu & Nani, 2020) thus end up losing their market share. Globalization has also played a significant role in increasing the danger that managers face in running of their business. Customers have increasingly become informed and conscious as the supplier's numbers increase exponentially (Silvesther, 2020). Ngeta and Kisimbii (2020) note that the current products have a shorter product life cycle compared to the previous making it necessary to reduce their time in the market. It is therefore essential for organizations to reduce wastes and manage their costs effectively. To be able to achieve the targets mentioned above, the use of electronic procurement (e-procurement) that includes electronic reverse auctions allows for the reduction of costs, errors in processing and time and also reduces purchasing prices as observed by Oh (2021). Hanák, Marović and Jajac (2020) propose that the enhancement of Procurement Performance through Electronic procurement (e-Procurement) methodologies continues to shape firms' supply chain competitiveness and performance.

In a number of growing procuring entities, electronic reverse auctions (e-RAs), a subset of (Electronic Procurement Methodologies), has become part of the strategic sourcing tools that allow for efficient sourcing of goods and services which are standardized significantly, allows for sufficient volume of spend, may be replicated by qualified competitors and bears insignificant costs for switching (Wu, Kao & Ho, 2021). Electronic Reverse Auctions have been identified as a key strategic electronic sourcing tool for the present and the future ((Wu et al., 2021; Oh, 2021; Hanák et al., 2020). It therefore goes without saying that firms need to tap into this strategic tool and resource to take advantage of its proven benefits.

The pharmaceutical industry across the world bears a significant responsibility in developing, production and marketing of pharmaceuticals. The pharmaceutical industry across the world recorded a revenue of over a trillion dollars in 2018 and this is to grow to over 1.3 billion dollars in 2012 (The Thomson Reuters, 2019). The North American region is among the regions that accounted for the significant increase in the revenue portion. This is based on the fact that the

USA, which is a significant player in North America, has leading pharmaceutical industries across the world. A further analysis of the market provides a revelation of the Chinese pharmaceutical industry which has grown significantly and is perceived to be an emerging industry as it records the highest very significant growth rate compared to those of other entries (Ward & Waldmeir, 2014). Based on brands and companies the companies under the United States multinational pharmaceuticals are market leaders as firms such as GlaxoSmithkline and Pfizer among others lead in revenue earnings. Moreover, pharmaceutical products that are patented, branded often provide the highest revenue share compared to pharmaceutical revenues. It is also based on the fact that the success of the pharma industry is based on research and development.

Theories that explain the environment where organizations operate and means by which Electronic Reverse Auction can be aligned to fit in ensuring that procurement performance is achieved were covered. These theories include Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and Task-Technology Fit Theory. These theories were explored and elaborated in the subsequent chapter.

### **1.1.1 Electronic Reverse Auction**

Alber, Zaitul and Rika (2021) observes that traditional buyers often submitted a static three quote closed bid in selection of suppliers based on the traditional model. Zhang and Liu (2021) add that every supplier was to respond once with their best offer although their bid amounts were hidden to their competition. Electronic reverse auctions are different, for instance, multiple suppliers, about 10 to 20 are involved in the process (Engin & Vetschera, 2019), although they may be as minimum as three suppliers who are petitioned in order to undertake in an online ERAs where they have the liberty to submit a number of bids while their competing prices of their bids are public to all the other parties to see (Markhed Maxe & Mace, 2020). In comparison, the traditional bidding may vary from weeks to across couple of months (Delina, Senderáková, Olejárová & Macik, 2019), while the online reverse auctions may last for only half an hour to an hour.

Delina and Grof (2019) adds that this was a landmark development in the history of e-business as it was a movement from conventional procurement process to an avant-garde procurement process. However, electronic reverse auctions are yet to realize their full potential (Dráb, Štofa & Delina, 2020; Msuya, 2020; Ngeta & Kisimbii, 2020). Electronic Reverse Auctions, also termed as the

Downward Price Auctions, provides a platform for various supplying entities to participate in competition for buyers request for products (Marei, Daoud, Ibrahim & Al-Jabaly, 2021). It is named Electronic Reverse Auction appropriately as the price often falls during the auction compared to the traditional auction model where the prices do increase with the entry of more bids (Rukuni, Maziriri & Mulaudzi, 2020; Soong, Ahmed & Tan, 2020).

Based on the institute of supplies management context with regards to procurement, a reverse auction is an auction which is undertaken online in real time amongst a purchasing entity and its prequalified vendors (Delina & Grof, 2019). The competition is in suppliers presenting their bids to the buyer to supply services and goods that have predetermined specification, quality, delivery and designs (The Institute for Supply Management, 2019; Frimpong, Andoh-Baidoo & Asamoah, 2020). Bentaleb (2020) notes that in procurement, reverse auction is the real time competitive bidding online event where buyers send out quotation requests and the vendors bid on while reducing their asking prices to an optimal point where a true market price is reached. A reverse auction can be formally referred to as an online real-time auction between two or more invited suppliers and the buying entity (Delina et al., 2019) where the suppliers submit several bids across the auction period and where there is a degree of visibility among the suppliers based on their competitors' actions (Wu et al., 2021; Oh, 2021; Hanák et al., 2020).

Bhatt et al. (2020) and Zhang and Liu (2021) found out that the drastic increase in the use electronic reverse auctions has been as a result of conversion of a number of external and internal forces of development. These include: (i) increase in the ability of communication among the buyers and suppliers across the world in real time by use of the internet, (ii) development of a user friendly robust software that is internet based to support electronic reverse auctions worldwide that are being outsourced or are performed in-house by the firm with minimum assistance from the outside and, (iii) order-of-magnitude recent quality improvements and reduction in cycle-time has made the buying companies to perceive better quality. Yu et al. (2020) concludes that as a result, there is a shift of emphasis towards low prices as a significant sourcing variable in decision making.

### **1.1.2 Procurement performance**

Organizations globally are factoring in a composite of objectives and initiatives to ensure an efficient and effective procurement function (Musewe & Moronge, 2021). Chiappinelli (2020)

notes that any supply chain management department can perform well if the following five critical elements are practiced along the supply chain; performance of suppliers, service to customers, professionalism, performance in cost and future setting of direction. The evolution of supply chains has made it essential that anything that can be measured should not only be relevant to the company but is also relevant across all areas of the supply chain (Bairo & Mbise, 2020). According to Kumar and Ganguly (2020), cost minimization, improved productivity and guaranteed provisions are profit gain measurements within the supply chain. Procurement performance is often judged by cost synergies. Measuring procurement should be largely an improvement process. After measuring, gaps should be filled to save on leakages. Procurement is a diverse function with numerous tiers of suppliers and participants (Musau, 2020). Performance measurement practices therefore consider crucial aspects established by all the participants and offers results pursuant to the organization goals. Measuring the performance of a Procurement department can be complex and yet firms must labor to outline the criteria used as noted by Shaharudin, Suhaimi, Fernando, Husain and Suparman (2021).

Procurement performance is made up of how well an entity's procurement objectives have to be realized and the level to which the function of supply chain is able to realize value for money that is spent on the goods, services and works as explained by Bairo and Mbise (2020). Mezgebe and Zewde (2020) add that the extent to which Procurement function results to the efficiency of value for money spent on goods, works and services is the most significant indicator of performance in procurement. Ravenda et al. (2020) note that Procurement Performance is made up of efficiency and effectiveness in procurement. Efficiency in Procurement refers to the association that exists between actual and planned resources that are required to realize the formulated objectives. Effectiveness in procurement considers several indicators that include management of deliveries, quality of suppliers, timely delivery of inventory, cycle time for orders, documentation of material defects (Shaharudin et al., 2021). Musewe and Moronge (2021) opine that an effective measurement of performance helps management to come up with better procurement decisions that are essential for improvement of accountability and performance. It improves on the optimal allocation of resources and evaluating alternative approaches to procurement to increase flexibility in operations (Kumar & Ganguly, 2020).

Performance in procurement may be assessed easily through emphasizing focus on technology, cost, delivery times and quality (Mezgebe & Zewde, 2020). This ensures that the materials sourced are procured at the right time and cost. Procurement performance also aims to enable environments in the process of procurement in an entity to boost the quality of delivery of firm products and service at the least cost and time (Chaponde, 2020). Most organizations today blend their objectives and initiatives to make sure that their procurement discipline is effective and efficient. Procurement evolution has made it essential for everything that is being measured to be important both to the company and the entire process of procurement (Shaharudin et al., 2021). In Procurement, measurement results to an entity's profit maximization, reduction in cost, enhanced productivity and guarantees provisions as concluded by Chiappinelli (2020).

### **1.1.3 Multinational Pharmaceutical Corporations in Kenya**

Multinational corporations have been described as organizations that control production, marketing or sale of goods and services in one or more countries other than their home country. Like organizations operating in other industries, pharmaceutical companies have managed to expand their operations beyond the borders of their mother companies, and some have steadily grown in many countries all over the world. With liberalization of pharmaceutical market, Kenya has faced high influx of Multinational pharmaceutical companies from India, Europe and America. Some of these companies especially from India are popularly known for marketing of generic drugs in Kenya while those from Europe and America do market mostly original pharmaceutical products. Some of the prominent multinational pharmaceutical companies in Kenya include Sun Pharma, Ella Lilly, Novartis, Novo Nordisk, Bayer, Merk Serono, Pfizer, Menarini, AstraZeneca amongst others (Pharmacy and Poisons Board, 2019).

The Kenyan pharmaceutical industry consists of both local companies and multinational entities that have set up their offices to market and distribute pharmaceutical products in Kenya. Some of the local companies that have been started and still operate in Kenya include Dawa Pharmaceuticals, laboratory and Allied Ltd, and Sphinx Pharmaceuticals. This industry plays an important role in importing, packaging and distribution of medicine. Currently, Kenya's pharmaceutical industry is ranked as the most significant industry in the production of pharma products across the Common Markets of East and South Africa (COMESA) region, as they are accountable for the supply of up to 50% of the supplies in the regions' market. According to Kenya

Pharmaceutical Health Report 2010, this industry has continuously experienced rapid growth due to increased expenditure on healthcare and growing countries economy. By end of 2014, the industry was reported to be worth KES 33.5 billion (Luoma, *et al.*, 2010). The three levels of distribution channel of products in the pharmaceutical industry which includes the importers or manufacturers, distributors and retailers plays role in delivering health care products to the consumers. In collaboration with other healthcare service providers like doctors, this industry has immensely contributed to the improvement of healthcare access in the country (Luoma, *et al.*, 2010).

Kenya has very high concentration of healthcare providers in urban areas than rural area with access to health facilities at urban areas being 70% in comparison to 30% in rural areas (Kenya National Bureau of Statistics, 2010). This can be associated to the infrastructural development and higher buying power of citizens in urban areas than rural areas. With devolution of health services to the county governments, this statistic is likely to change with improved access to healthcare services and effective distribution of drugs by pharmaceutical companies to rural Kenya. In 2010, United Nations Industrial Development Organization, UNIDO, estimated that there were 9000 pharmaceutical products registered in Kenya. This number has since tremendously grown and at the end of 2015, there were over 15000 registered pharmaceutical products (Pharmacy and Poisons Board, 2016). This increase in pharmaceutical products has been associated with inflow of more companies into the country leading to increase in competition for the existing market.

## **1.2 Statement Problem**

If Multinational Pharmaceutical Corporations are to sustain their competitiveness and uphold the market shares, they must come up with measures that enable them to penetrate the market to be able to increase their profits and customer base. As a result, they are to devise strategies to penetrate more in the market so as to increase their customer base and profits. The use of Electronic reverse auctions leads to considerable gains, for instance the ability to outperform competitors by reducing the cost of tendering process and getting the best prices through a transparent process (Zhang & Liu, 2021). Hanák et al. (2020) add that the process also eliminates corruption and coercion on awarding tenders and promotes fair competition among all bidders. The pharmaceutical industry is slowly growing and expanding necessitating the need for organizations



to make use of the appropriate strategies which would improve their procurement performance. The adoption of Electronic Reverse Auctions is imperative for Multinational Pharmaceutical Corporations as it enables cost reduction directly that is realized through improving on efficiency in procurement process.

There exist several studies on Electronic Reverse Auctions globally, regionally and locally. Globally, Pawar, Behl and Aital (2017) carried out a research on systematic literature review on electronic reverse auction with the aim of investigating the evolution of electronic reverse auction with special focus on supplier participation, spend category and auction size. Hanak, Marovic and Jajac (2020) focused on the drawbacks facing electronic reverse auction in the construction industry. Systematic literature review was adopted. The outcomes illustrated the studies were founded on addressing five main areas that include Electronic Reverse Auctions sustainability for tenders in construction, the subsequent barriers and drivers, considerations in ethics, potential inswings and behavior in bidding as well as the distribution of bids. Radovan, Tomáš and Delina (2020) analyzed the efficiency of electronic reverse auction setting and it was established that electronic reverse auction enhances supply chain efficiency. Zhang, Li and Huang (2017) on performance analysis of reverse auction mechanism established that there is massive cost saving upon the adoption of electronic reverse auction.

Locally, Onjala (2017) on the implementation of e-procurement and dairy firm's performance of SC in Kenya established that the dairy entities had moderately adopted e-procurement and the participants showed that Electronic Reverse Auctions contributed to supply chain performance to a large extent. Abdullahi (2018) studied e-sourcing and performance of Private Hospitals in Nairobi. Descriptive research design was adopted, and e-procurement largely influenced procurement performance. Waganda (2018) focused on electronic procurement at the United Nations Agencies Performance in Nairobi and established existence of a positive association of e-sourcing to performance. The findings also reveal that most of participants were neutral as to whether e-auctioning process affects the procurement function performance in the organization they agreed that e-auctions provide buyers and sellers an open environment.

A significant volume of literature related to impact of electronic reverse auction of procuring entities has been published over time. This study was founded on the basis that very little literature

exists on the impact of electronic reverse auction on Procurement Performance in Multinational Pharmaceutical Corporations in Kenya. Therefore, this research aimed at addressing this gap in the extant literature as the nuances of MNCs in the Pharmaceutical Industry in Kenya may differ from MNCs in other industries and countries. This study endeavored to carry out an in-depth study on Electronic Reverse Auctions adopted by MNCs in the pharmaceutical sector to try and fill this void. The aim of the paper was to establish whether there is an existing correlation between electronic reverse auction and procurement performance in MNCs pharmaceutical in Kenya. The research therefore sought to provide answers to the following questions: To which extent have the multinational pharmaceutical corporations in Kenya adopted Electronic Reverse Auction? What is the correlation between electronic reverse auctions and procurement performance of the multinational pharmaceutical corporations in Kenya? And what are the challenges faced in adopting electronic reverse auctions by the Multinational Pharmaceutical Corporations in Kenya?

### **1.3 Research objectives**

The key objective was to determine the influence of electronic reverse auction on procurement performance in Multinational Pharmaceutical Corporations in Kenya.

Specific objectives were:

- i. to establish the level of adoption of electronic reverse auctions by the Multinational Pharmaceutical Corporations in Kenya,
- ii. to establish the relationship between electronic reverse auction and procurement performance of Multinational Pharmaceutical Corporations in Kenya, and,
- iii. to find out the challenges faced in adopting electronic reverse auction by the Multinational Pharmaceutical Corporations in Kenya.

### **1.4 Value of the Study**

The outcome of this research will greatly provide pertinent information to several stakeholders who include the industry players from both the Local and Multinational setting. Multinational firms will be able to better understand the Kenyan pharmaceutical industry and suitability of

Electronic Reverse Auctions in remaining competitive and improving their procurement performance. Local firms will also understand the benefits of electronic reverse auctions and be best equipped to compete with the Multinational pharmaceutical firms in the country. This study will enable pharmaceutical firms both local and Multinational in identifying and embracing the use of ICT and Electronic Reverse Auctions to minimize their cost of procurement.

Kenya's health Ministry and by extension the Pharmacy and Poisons Board is tasked in implementing and developing National Drug Policy. Through this study, these institutions will manage to draft policies which enhance fair competition and somewhat level-up the playing field in the industry's competitive environment. The Ministry and the board will also use the study to better come up with sustainable regulations governing the pharmaceutical corporations in Kenya.

This study will benefit academicians as it will provide new knowledge and enhance an in-depth understanding to Electronic Reverse Auctions and procurement Performance. The recommendations of the study will also be used by academicians to give insight on further researchable areas related to the current study. The study findings will also be used for comparison and generalization of the previously done related studies.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This section contained the past empirical literature on Electronic Reverse Auctions and Procurement performance. It covered the relevant theories related to Electronic Reverse Auctions and some of the factors that prompt managers to adopt Electronic Reverse Auctions. The chapter also broadly discussed Electronic Reverse Auctions, cover empirical literature review, challenges faced in the implementation of Electronic Reverse Auctions and proposed Conceptual Framework.

### **2.2 Theoretical Framework**

The adoption of electronic reverse auction is often affected by several factors. Several theories and Models have been used to provide an explanation on adoption of technology and its implementation. These models and theories include Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and Task-Technology fit Theory

#### **2.2.1 Technology Acceptance Model (TAM)**

It was first proposed by Davis in 1986. The model has been vital in explaining technological behaviors (Chen, Shing-Han & Chien-Yi, 2011). The TAM is a theory on models of information systems on how the users embraces and make use of IT (Chen et.al, 2011). Whenever Users are provided with an innovative technology, several elements affect their stance on how they make use of it (Alexandru, 2014). Mathieson, Peacock and Chin (2001) argue that TAM bears the ability to provide an explanation towards the use of an information system compared to the other multi-attribute models. Based on TAM, attitude is affected by two significant elements which determine the technological behavior. These entail the usefulness that is perceived, and the ease of use perceived by the Users (Davis, 1989; Igarria, Parasuraman & Baroudi, 1996). Perceived usefulness based on the Davis (1989) definition, is the level that an individual believes the system is easy to practice.

TAM perceives the ease of use and perceived usefulness along with the particular standards are essential factors which affect an individual's adoption decision. They are the two most important indicators that explain the embracing of IT by individuals (Taylor et al., 1995). The theory is

pertinent to the topic since there can never be an effective electronic reverse auction devoid of technology. Technology eases the integration of the firm with external partners (suppliers) and enhances a seamless procurement process. The framework is also relevant to the current study as firms will only embrace electronic reverse auction technology in their procurement processes if it's perceived to be beneficial.

### **2.2.2 Unified Theory of Acceptance and Use of Technology (UTAUT)**

Venkatesh et al. (2003) assembled the previous literature that were based on usage and acceptance of IT and provided an all-inclusive view of the personal acceptance and the usage behavior that pertains to IT. The researchers proposed a new framework known as the UTAUT which identifies pertinent determinants in accepting and embracing technology. These include anticipation in performance, social impact and enabling conditions. Furthermore, the information technology literature on implementation (Ang et al., 1995) recognized 4 critical elements: support by senior managers, training of users and involvement of users. Support by the senior managers is often reflected in two ways that include provision of the resources that are necessary for IT application implementation and significant role undertaken to resolve disputes which emanate from IT systems introduction.

UTAUT is pertinent to the current research as it emphasizes the necessity for accepting and embracing technology to be used in the organization. It also shows that management is crucial in ensuring that the employees accept the changes pertaining to Technology. Since Electronic Reverse Auctions takes place in an online platform, there is need for technology acceptance as without it, the auctions cannot take place.

### **2.2.3 Task-Technology Fit (TTF) Theory**

Task-Technology Fit (TTF) theory is based on the view that IT is likely to impact positively on the performance of an individual in a firm and it may be useful if information technology capabilities are in line with the tasks the users are to undertake (Goodhue and Thompson, 1995). Goodhue and Thompson (1995) works are credited for developed the measure of task-technology fit and it is made up of 8 factors that include: quality, locatability, authorization, compatibility, training ease, timelines in production, systems reliability, and user relationship. The researchers found the measures of TTF, along with its utilization, can significantly predict user reports of

improved performance on their jobs and effectiveness which can be directly attributed to the use of the system that under study.

Although the TTF model by Goodhue and Thompson (1995) operates based on an individual level of analysis, Zigurs and Buckland (1998) presented a model that is analogous which operates at a group level. Based on the initial work, TTF has been used on a diverse range of systems of information that entailed systems of electronic commerce and along with the use of an extension of other models that are related to IS outcomes such as the technology acceptance model (TAM). This theory is therefore important to the current study since technology is key in Electronic Reverse Auctions implementation and therefore organizations must embrace the use of technology to be able to have an effective and efficient supply chain and enhance procurement performance.

### **2.3 Electronic reverse Auction**

Use of electronic reverse auctions was measured through Access to Global suppliers, Competitive Prices and Provision of Level Playing Field. These measurement parameters are discussed below.

#### **2.3.1 Access to Global Pool of Suppliers**

Electronic reverse auctions provide access to global pool of suppliers as the process takes place virtually in an electronic platform. This gives the vendors an opportunity to participate in the tendering process regardless of where they are. Accessing global suppliers is made possible through engaging them earlier through trainings, provision of clear specifications and eventually selection of qualified suppliers who can be able to deliver what the entity needs. Early supplier involvement is engaging the supplier at an early stage before the actual procurement of goods or services takes place as defined by Awan, Nauman and Sroufe (2021). Early supplier involvement in the development of products and the design process improves the success rate and provides an advantage in the contemporary marketplace as many suppliers are involved (Gerhart, 2020). Wohlgezogen, Hofstetter and Hamann (2020) conclude that early supplier engagement enhances cost reduction and quality, saves time and increases efficiency. Specifications must be clear and should accurately define expectations of the suppliers. Specifications should not have any ambiguity as it may result to potential suppliers providing incomplete responses as noted by Yu et

al. (2020). Bhatt, et al. (2020) noted that the first principle of procurement is to get the specification right.

Supplier training is also vital in broadening the global pool of suppliers as suppliers are trained on how the auction will take place (Moradlou, Roscoe & Ghadge, 2020), the duration that the auction will take (Benton Jr, Prahinski & Fan, 2020) as well as provision of all the information and answered questions when it arises (Adesanya, Yang, Iqdara & Yang, 2020). Chen, Ming, Zhou and Chang (2020) opine that the greatest challenge procuring entities face is selecting their suppliers. Choosing appropriate suppliers may lead to increase in sales and improved performance (Dalić et al., 2010) and thus the firms need to choose the right suppliers. Tirkolae et al. (2020) stated that an effective supplier selection process can be measured in terms of quoted prices, time of delivery, quantity of goods and services, whether the supplier is able to react conveniently towards the entity requirements and the convenience of the location of suppliers. All the suppliers in the electronic reverse auctions are given equal opportunities and they are selected based on their merits irrespective of where they are located. This thus provides a wide pool of suppliers as well as enhances competition. The quality of product is also boosted as only the most qualified suppliers are selected (Gao, Ju, Gonzalez & Zhang, 2020).

### **2.3.2 Competitive Prices**

Electronic reverse auctions are competitive and useful tools in selection of suitable suppliers as noted by Hanak et al. (2020). Electronic reverse auctions embody a unique case of electronic negotiation such that diverse vendors compete in tendering to supply whatever the entity needs by reducing their prices while bidding (Badi & Pamucar, 2020; Chai & Ngai, 2020). A big number of participants in the auctions is critical in creating a competitive surrounding for the tendering process. Badi and Pamucar (2020) revealed that the root cause for implementation of electronic reverse auctions is to negotiate for the best value of money in the most competitive way possible. Furthermore, they argue that electronic reverse auctions can be viewed as a solution facilitating short-term financial objectives. Information sharing with all the key suppliers who are participating in the electronic reverse auction also enhances the competitiveness of prices given by the suppliers.

All the vendors have all the relevant information that is needed and therefore can give competitive prices as to the best of their abilities as observed by Reitsma, et al. (2020). Adesanya, Yang, Iqdar and Yang (2020) also noted that the participation of many bidders in an electronic reverse auction creates a sufficient level of competition. Increased competition, as measured by the number of bidders, puts pressure on suppliers to lower their prices as well as expected margins. As Seyedghorban, Simpson, and Matanda pointed out, electronic reverse auctions today provide a streamlined way for both sides of the procurement equation to communicate and collaborate, allowing competitive bidding processes that previously took weeks or even months to complete to be compressed into days or even hours (2020). Suppliers are more willing to compete when dealing with standardized or well-specified products because they are more certain of what they are bidding on. This enables them to compete with assurance (Kwofie, Aigbavboa & Thwala, 2020).

### **2.3.3 Level Playing Field**

Electronic reverse auctions offer a level playing field to all the participating suppliers. This is achieved as all the relevant information is provided to the shortlisted suppliers all at the same time (Alzoubi & Yanamandra, 2020). Trainings are also carried out early in advance to the suppliers so that all of them have the ability of participating in the auction as each of them has been equipped with the knowledge and skills on how the auction works and has all the relevant information needed to participate in the process (Niu & Bian, 2020). The trainings involve practical demos using the electronic reverse auctions software. Alibeiki and Gümüs (2020) also note that the field is levelled as each participant is given the exact time to participate in the auction. This is done as the period for the auction is provided to all suppliers and they are told way in advance the time that the auction will start and the time that the auction will end (Gholizadeh, Fazlollahtabar & Khalilzadeh, 2020). During the auction period, the suppliers are required to compete and offer their best prices for the products being advertised. Chen et al. (2021), the benefits of electronic reverse auction include equal conditions for entering the business and discovering the true market price for items being purchased. To ensure a level playing field, all auction rules and conditions must be provided and clearly explained to suppliers. As the auctions happen on internet-based platforms, electronic reverse auctions contribute to greater transparency of the purchasing process, as proposed by Benton Jr, Prahinski, and Fan (2020). The auction data and records from the



training phase, practical test demos (mock auctions) are all database in the electronic reverse auction software therefore maintaining a clear Audit trail.

According to Moradlou, Roscoe, and Ghadge (2020), one of the primary differences and benefits of reverse auctions over other procurement and negotiation methods is time. Even if more time is required to ensure that all parties are properly trained in how to participate in the auction and fully understand the specifications for the items being contested, reverse auctioning should result in "shorter overall procurement time" (Reitsma, et al., 2020). This is due to the accelerated nature of the negotiations, which are carried out through the simultaneous evaluations performed by the vendors participating in the reverse auction (Gerhart, 2020). According to research, the dynamic pricing of reverse auctions increases the likelihood that the buyer and selling organizations will meet at a price point that reflects the true, fair market value of the item in question for any given procurement scenario (Arentsen) (2020). Buyers benefit from knowing they are getting real-time market pricing on the goods and services they are purchasing for their company. Suppliers can benefit as well, because they can balance internal managerial considerations with their ability to offer pricing that is most advantageous to them at the time, as concluded by Bhatt et al (2020).

## **2.4 Empirical Literature Review**

Numerous studies have been undertaken locally and globally on Electronic reverse auction and procurement performance. The results have been conclusive on the relationship between the two. Globally, Pawar, Behl and Aital (2017) carried out a research on Systematic Literature Review on electronic reverse auction with the aim of investigating the evolution of electronic reverse auctions with special focus on supplier participation, spend category and auction size. Hanak, Marovic and Jajac (2020) focused on the drawbacks of electronic reverse auctions in the construction industry. Systematic Literature Review was adopted. The study findings showed that the research addressed five significant areas; the sustainability of electronic reverse auctions for tenders in construction, savings potential and bidding behavior, related barriers and drivers, ethical considerations and bid distribution. Radovan, Tomáš and Delina (2020) conducted an analysis of electronic reverse auctions setting efficiency and it was established that electronic reverse auctions enhances supply chain efficiency. Zhang, Li and Huang (2017) on Performance analysis of reverse auction

mechanism established that there is massive cost saving upon the adoption of electronic reverse auction.

Muraya (2016) discussed e-procurement and the sustainability of Kenyan state corporations. The study used a graphic study design with an average population of 262 state corporations, and thus stratified random sampling was adopted. Information was gathered by use of questionnaires which was then analyzed using descriptive statistics. The outcome indicated that e-tendering minimizes costs, shortens lead times, enhances quality and increases flexibility. Electronic Reverse Auctions were discovered to help State Corporations achieve strategic sourcing goals. E-sourcing aided in cost-cutting and efficiency improvement of sourcing processes. Onjala (2017) on electronic procurement implementation and supply chain performance of Kenyan Dairy companies determined that the Dairy processors had moderately adopted e-procurement and e-reverse auctions contributed to Supply Chain performance. The research adopted a descriptive design and information was acquired using questionnaires and analyzed quantitatively.

Waganda (2018) focused on the effects of Electronic Procurement on United Nations Agencies performance in Nairobi and established that there exists a positive association of e-sourcing to performance of United Nations Agencies in Nairobi. This positive association suggests that when one increases, performance of United Nations Agencies in Nairobi increases. The research concludes that e-tendering, e-auctioning, e-invoicing and e-sourcing are statistically significant and influences performance of Nairobi's United Nation Agencies. The findings affirm that the process of e-tendering affected the procurement function performance in the company. On whether the process of e-auctioning affects the procurement function performance in the company, the respondents were neutral as they agreed that e-auctions provided the buyers and sellers an open environment.

## **2.5 Challenges of Adopting Electronic Reverse Auction**

Based on the traditional procurement weakness it is still baffling that the movement to the new e-procurement tools has not been fully embraced wholesomely. As established by Deise, 2000; Srivivasan 2004; and Issa et al 2008, the reluctance by the organizations in all sectors of the economy to move to e-procurement is not because of technology and cost but a complexity of inhibitors that were examined in several published academic research materials. Along with the

inhibitors, there exists several specific inhibitors such as security risk of transacting over the internet, absence of compatible software systems with the already existing solutions and the unwilling nature of buyers and supplier to adopt ecommerce. Hawking et al (2004) study on SMEs in Australia noted the significant drawback was the lack of single e-procurement solutions that resulted to lack of standardization procurement. For instance, there exist several standards in procurement in categorization of services and goods that include UNSPSC and CPV. There is no supplier adoption as a result, providing very expensive solutions of e-procurement.

The e-procurement overview by Corsi (2006) states the implementation of e-procurement drawbacks can be classified broadly in the challenges of the organization or the challenges in economic and legal frameworks. The challenges that emanate during the implementation entail the resistance to change by users based on the normal nature of humans. The companies that implement new systems are often faced with the fear of the unknown. Furthermore, several users believe that e-procurement makes their jobs to become more cumbersome and difficult. As a result, this brings about resistance when implementing as the users are not aware of how the system works and lack the necessary training in the use of the system. In addition, end users are of the opinion that their jobs would change significantly based on of e-procurement adoption as new systems of IT are known to alter the job structure of employees whenever they are phasing out the old system that is majorly manual in nature. Public entities are known to hub corrupt practices which are hindrances to institution of e-procurement. Transparency International Corruption Index Report 2013 indicated that Kenya is fourth significantly corrupt state globally and the spotlight has been on the public sector on the issuance of tenders. E-procurement has brought about transparency and as a result, resistance has emanated from the users who often frustrate the implementation of the new system.

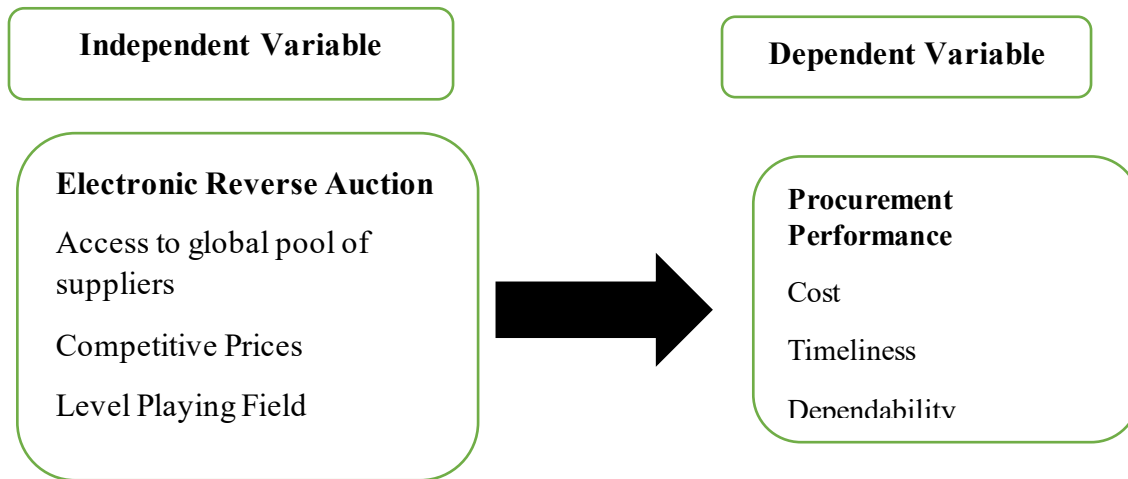
Challenges in Economic-legal fronts that are encountered by organizations whenever they undertake implementation entail the country's level of economic development. Weak economies are easily manipulated in the process of implementation based on the systems loopholes. Moreover, the regulatory environment which governs e-procurement is a significant element that hinders the e-procurement implementation. The framework of procurement may hinder e-procurement implementation posing a significant drawback. Technological frameworks may also

hinder the adoption of e-procurement along with the competition service from private sector that may provide e-procurement services resulting to a reluctance in public adoption of e-procurement.

## 2.6 Proposed Conceptual Framework

A conceptual framework shows the association that exists between the variables under study. The independent variable was Electronic Reverse Auction whose dimensions are access to global pool of suppliers, competitive prices and level playing field while the dependent variable was Procurement Performance represented by Cost, Timeliness and Dependability. It was assumed that adopting Electronic Reverse Auctions will enhance improved Procurement Performance. The framework is depicted in figure 2.1

**Figure 2. 1 Conceptual Framework**



**Source: Research Data (2021)**

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The chapter provides for the methodology embraced. The chapter outlines the research design, population, data collection and analysis instruments that were used.

### **3.2 Research Design**

A research design describes the method of carrying out a study. It guides the researcher in collecting, analyzing and interpreting data collected on the population of study (Orotho, 2003). Descriptive design was adopted as it allows the researcher to obtain information and give a description of current phenomenon describing what exists with reference to situation. This enables one to obtain accurate profile of person, event or place (Cooper and Schindler, 2008). Cross-sectional survey enable researcher to collect data from different pharmaceutical companies over short period of time while offering significant control over measurements to maximizes completeness of data and usually requires no follow ups (Mugenda, 2003).

### **3.3 Population of the Study**

The population were all the registered multinational pharmaceutical corporations operating within Kenya. All of these firms operate within Nairobi and its environs. According to the Pharmacy Poisons Board, there are 34 Multinational Pharmaceutical Corporations in Kenya (Appendix III). The study only targeted the multinational pharmaceutical corporations that are licensed by the Kenyan Pharmacy Poisons Board which are 34 in number (Pharmacy Poisons Board, 2019). A census was executed due to the minimal nature of the population.

### **3.4 Data Collection**

The research adopted primary data that was gathered by structured questionnaires. The primary data was adopted due to the accuracy of the information and firsthand experience of the respondents. The questionnaire was comprised of open and close ended statements using Likert's scale. The questionnaire was partitioned in 4 segments. Section A covered Background Information on the Multinational Pharmaceutical Company, Section B had statements on

Electronic Reverse Auctions, Section C had statement on Procurement outcomes of adopting Electronic Reverse Auctions while Section D covered statements on challenges of implementing Electronic Reverse Auctions. The respondents were employees in Procurement, Supply Chain and ICT departments. Drop and pick or mailing the questionnaire were the methods of administration. Two questionnaires were dropped in every multinational pharmaceutical firm. Self-administered questionnaires were appropriate for this study since they decrease the level of bias that could potentially be brewed from interviewer’s presence. A structured one is also ideal since this it aided in ease of analysis of the data.

### 3.5 Data analysis

The gathered data from study’s participants were entered in SPSS tool. For objective (i), which was to determine the extent adoption of Electronic Reverse Auction, descriptive analysis using standard deviation (S.D) and means was adopted while regression analysis was used to ascertain the link among Electronic Reverse Auction and Procurement Performance of Multinational Pharmaceuticals in Kenya.

**Regression model:**  $Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + e$

Where: Y = Procurement Performance, a = y intercept when x is zero, b<sub>1</sub> to b<sub>5</sub> = weights attached to ERAs, x<sub>1</sub> = information sharing, x<sub>2</sub> = supplier training, x<sub>3</sub> = early supplier engagement, x<sub>4</sub> = clear specification and X<sub>5</sub> = supplier selection.

**Table 3. 1 Summary of Data Collection and Data Analysis**

Objectives	Data to be collected	Method of data collection	Analysis needed
Background information	<b>A</b>	Structured Questionnaire	Descriptive Statistics (Percentages)
Electronic reverse Auction	<b>B</b>	Structured Questionnaire	Descriptive Statistics (Mean and Standard Deviation)
Electronic reverse Auction and Procurement Performance	<b>C</b>	Structured Questionnaire	Regression analysis
Challenges faced in implementation	<b>D</b>	Structured Questionnaire	Descriptive Statistics (Mean and Standard Deviation)

**Source; Research Data (2021)**

## CHAPTER FOUR:

### DATA ANALYSIS, FINDINGS AND DISCUSSION

#### 4.1 Introduction

This chapter focused on presenting the results from analyzing the respondent's feedback that were obtained from the filled questionnaires.

#### 4.2 Response rate

The targeted respondents were from 34 multinational pharmaceutical corporations in Kenya and two questionnaires were administered in each firm bringing a total number of respondents to 68 out of whom 54 were duly filled and returned. This thus places the response rate at 79.41%.

#### 4.3 General Information

The respondents' departments and positions they held, period of work in the position and time which the multinational pharmaceutical corporations have been operating in Kenya were explored and the outcome subsequently presented.

##### 4.3.1 Department and position

The respondents were asked to indicate the departments they belonged to and the managerial positions they held. Table 4.1 presents the outcome.

**Table 4. 1 Department and position**

<b>Department</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Supply chain	21	38.89
Procurement	19	35.19
ICT	14	25.92
<b>Position in entity</b>		
Top Management	26	48.15
Mid-level management	21	38.89
Junior staff	7	12.96
<b>Total</b>	<b>54</b>	<b>100</b>

**Source; Research Data (2021)**

Table 4.1 shows that 38.89% of the study's participants were from supply chain department, 35.19% from procurement department whereas 25.92% were from ICT department. This indicates that the respondents were from departments that are directly involved with electronic reverse auctions.

The respondents also had to indicate whether they are in management and 48.15% of them were from top management, 38.89% from mid-level management and 12.96% were junior staff. Thus 87.04% of the respondents represented respondents from mid-level to top level management and had knowledge of the subject being studied and were fit to fill the questionnaires.

#### 4.3.2 Period of existence and duration on work

The participants had to point out the duration which they had served for in their respective companies and the period which their firms have existed in the country and table 4.2 presents the responses.

**Table 4.2 Period of Existence and duration on work**

<b>Duration of work (years)</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Below 1	6	11.11
1 – 5	8	14.82
5 – 10	24	44.44
Over 10	16	29.63
<b>Existence period (years)</b>		
Below 5	4	7.41
5 – 10	24	44.44
Over 10	26	48.15
<b>Total</b>	<b>54</b>	<b>100</b>

**Source: Research Data (2021)**

The outcome in table 4.2 above indicates that 11.11% of the respondents had worked for less than a year in their respective company, 14.82% had worked for a period between 1-5 years, 44.44% for 5-10 years while 29.63% over 10 years. This is an indication that a large chunk of the respondents represented by 74.07% had worked for over five years in the multinational pharmaceutical corporations meaning that they were experienced enough to give responses to the study's questions.



Regarding period of existence of the multinational pharmaceutical corporations in Kenya, 7.41% of the firms had operated in Kenya for less than five years, 44.44% were operational for 5 to 10 years while 48.15% had existed in the country for over 10 years. This indicates that most of the multinational pharmaceutical corporations represented by 92.59% had been operational long enough to know the influence of electronic reverse auctions on procurement performance and thus were suited to participate in the study.

#### 4.4 Electronic reverse auction

The respondents had to agree or disagree to whether their company had in-house electronic reverse auction systems, whether procurement employees directly conduct electronic reverse auctions and whether their firms outsource electronic reverse auction process. The outcome is presented in table 4.3

**Table 4.3 Electronic reverse auction**

Factor	Frequency		Percentage (%)	
	Yes	No	Yes	No
Firm has electronic reverse auction system set up	35	19	64.81	35.19
Procurement staff carries out electronic reverse auction	29	25	53.70	46.30
Firm outsources electronic reverse auction process	41	13	75.93	24.07

**Source: Research Data (2021)**

Table 4.3 ascertains that 64.81% of the study's participants indicated that the multinational pharmaceutical corporations have fully functional inhouse electronic reverse auction systems set up. As to whether Procurement employees run the electronic reverse auctions, 53.70% pointed out that they do while the remaining 46.3% refuted. 75.93% of the respondents indicated that the multinational pharmaceutical corporations mainly outsource the activity of carrying out reverse auctions. This is an indication that in as much as most firms have electronic systems for reverse auction in place, the function is mainly outsourced to the third party and thus is always carried out by professionals.

## 4.5 Extent of adoption of electronic reverse auction

The study aimed at determining the extent to which the multinational pharmaceutical corporations in Kenya had adopted electronic reverse auctions and the outcomes are discussed in the table 4.4. A 5-point Likert scale was adopted with access to global suppliers, competitive prices and level playing field being the sub-variables under electronic reverse auctions.

### 4.5.1 Access to global suppliers

The extent of adoption of having access to global suppliers was examined and the results are tabulated in 4.4

**Table 4. 4 Access to global suppliers**

<b>Access to global suppliers</b>	<b>Mean</b>	<b>Std. Dev</b>
The firm invites a variety of suppliers	4.17	0.89
The firm carries out education and trainings to all suppliers	4.05	0.93
The firm provides clear specifications to all suppliers	4.53	0.49
The firm carries out supplier selection based on merit	3.84	1.13
The firm carries out earlier supplier engagement	4.09	0.94
<b>Overall score</b>	<b>4.14</b>	<b>0.98</b>

**Source: Research Data (2021)**

Table 4.4 signifies that the multinational pharmaceutical corporations' invite a variety of suppliers to a large extent as shown by the mean of 4.17 and deviation of 0.89. Carrying out education and trainings to all suppliers had a mean of 4.05 and SD of 0.93 and was both adopted to a large extent and. Provision of clear specifications to all suppliers had a mean of 4.53 and SD of 0.49 indicating it was adopted to a very large extent. The multinational pharmaceutical corporations carrying out supplier selection based on merit (M=3.84, SD=1.13) and engaging in earlier supplier engagement (M=4.09, SD=0.98) were adopted to a large extent as well.

The overall tally with the mean of 4.14 and SD of 0.98 implies that multinational pharmaceutical corporations had access to global suppliers to a large extent. The outcome aligns with that of Wohlgezogen et al. (2020) who posited that having a global pool and selection of qualified suppliers can be able to aid a firm in coming up with quality products and better provision of

services. All the suppliers in the electronic reverse auction are given equal opportunity and are selected based on their merits irrespective of where they are located which enhances competition as well as enhancing the quality of product as only the most qualified suppliers are selected (Gao et al., 2020).

#### 4.4.2 Competitive prices

The respondents had to rate the extent that competitive prices were adopted, and the outcomes are shown in table 4.5

**Table 4. 5 Competitive prices**

<b>Competitive prices</b>	<b>Mean</b>	<b>Std. Dev</b>
The firm shares vital information with key suppliers	3.92	1.06
The firm lets suppliers compete based on the prices	4.75	0.38
The firm provides a variety of suppliers to generate a competitive environment	4.03	0.98
The firm collaborates with the suppliers to enhance competition	4.54	0.43
<b>Overall score</b>	<b>4.31</b>	<b>0.78</b>

**Source: Research Data (2021)**

On competitive prices, table 4.5 shows that sharing of vital information with key suppliers (M=3.92, SD=1.06) and providing a variety of vendors to generate a competitive surrounding (M=4.03, SD=0.98) were both adopted to a large extent while allowing suppliers to compete based on the prices (M=4.75, SD=0.38) and collaborating with the suppliers to enhance competition (M=4.54, SD=0.43) were adopted to a very large extent by the multinational pharmaceutical corporations as indicated by the mean and standard deviations.

The overall score of 4.31 mean and 0.78 SD affirms that the multinational pharmaceutical corporation adopted competitive prices to a large extent. The outcome is consistent with that of Benteleb (2020) who notes that the suppliers bid on the items while reducing their prices to an optimal point where a true market price is reached. Zhang et al. (2020) note that competitive pricing is enhanced as each supplier can be able to view the bids of other suppliers and therefore lower their bids to arrive at the most competitive price. Hanák et al. (2020) add that Information sharing with all the participating suppliers in the electronic reverse auction also enhances

competitiveness of prices given by the suppliers. Badi and Pamucar (2020) revealed that the root cause for implementation of electronic reverse auction is to acquire best value for money in the most competitive way possible. Suppliers compete in tenders run via electronic reverse auctions to supply products by reducing their bid prices (Badi & Pamucar, 2020; Chai & Ngai, 2020).

#### 4.5.3 Level playing field

The adoption of level playing field was rated and the outcome are as below in table 4.6.

**Table 4. 6 Level playing field**

<b>Level playing field</b>	<b>Mean</b>	<b>Std. Dev</b>
The firm gives equal opportunities to all suppliers	3.56	1.47
Information is shared simultaneously to all the involved suppliers	4.55	0.54
Duration of the reverse auction is standard, and all the rules are applicable to all suppliers	4.83	0.28
All suppliers are simultaneously trained prior to the auction on how to participate	4.62	0.43
The firm provides all suppliers with precise and uniform description of the product or service to be supplied	4.81	0.29
<b>Overall score</b>	<b>4.47</b>	<b>0.68</b>

**Source: Research Data (2021)**

Table 4.6 points out that giving equal opportunities to all suppliers was adopted to a large extent with the mean of 3.56 and SD of 1.47., sharing of information simultaneously to all the involved suppliers (M=4.55, SD=0.54), standardizing the duration of the reverse auction and application of all rules to suppliers (M=4.83, SD=0.28), simultaneous training of all suppliers prior to the auction on how to participate (M=4.62, SD=0.43) and providing all suppliers with precise and uniform description of the product or service to be supplied (M=4.81, SD=0.29) were all adopted to a very large extent by the multinational pharmaceutical corporations in Kenya as indicated by their specific means and deviations.

The overall score indicates that level playing field, as an electronic reverse auction strategy, was adopted to a very large extent by the multinational pharmaceutical corporations as indicated by the mean of 4.47 and deviation of 0.168. The findings align with that of Delina et al. (2019) who noted that suppliers submit several bids across the auction period where there is a degree of visibility among the suppliers based on their competitors' actions thus the visibility enhances an equal

playing field for all. All the suppliers in the electronic reverse auction are given equal opportunities and they are selected based on their merits irrespective of where they are located.

#### 4.6 Procurement performance outcomes of implementing electronic reverse auction

The respondents had to give feedback on the extent that electronic reverse auction influences procurement performance of their respective multinational pharmaceutical corporations with procurement performances focusing on cost, timeliness and the dependability and the results are subsequently discussed and presented.

##### 4.6.1 Electronic reverse auction and Cost

The respondents were asked the extent to which electronic reverse auctions influences cost of multinational pharmaceutical corporations in Kenya and the outcome are tabulated in 4.7

**Table 4. 7 Electronic reverse auction and Cost**

<b>Cost</b>	<b>Mean</b>	<b>Std. Deviation</b>
Overall cost of procuring items has reduced	3.69	1.37
Cost of tendering process has decreased	3.76	1.39
Reduced corruption related costs due to transparency	3.52	1.51
Reduced cost of labour as less employees are required	3.43	1.64
<b>Overall score</b>	<b>3.60</b>	<b>1.49</b>

**Source: Research Data (2021)**

From table 4.7, reduction in overall cost of procuring items has a mean of 3.69 and SD of 1.37 while reduced cost of tendering process had a mean of 3.76 and SD of 1.09. Further, reduced corruption related costs due to transparency (M= 3.52, SD= 1.51) and minimization in cost of labour as less employees are required had a mean of 3.43 and SD of 1.64. The overall score (M= 3.60, SD= 1.49) implies that the adoption of electronic reverse auctions influenced the cost of multinational pharmaceutical corporations to a large extent. The outcome is consistent with that of Oh (2021) who found out that the use of electronic procurement (e-procurement) which includes electronic reverse auctions allows for the reduction of costs, errors in processing and time and also

reduces purchasing prices. Zhang and Liu (2021) found that Electronic reverse auctions lead to considerable gains like the ability to outperform competitors by reducing the cost of tendering process and getting the best prices through a transparent process.

#### 4.6.2 Electronic reverse auction and timeliness

Table 4.8 tabulates the performance results of timeliness upon adopting electronic reverse auctions.

**Table 4. 8 Electronic reverse auction and timeliness**

<b>Timeliness</b>	<b>Mean</b>	<b>Std. Dev</b>
Procured items are delivered on time	3.50	1.49
The firm experiences reduced delivery lead time	3.51	1.45
Reduced duration of the tendering and sourcing process	3.67	1.67
Reduced product/service requisition time	3.59	1.60
<b>Overall score</b>	<b>3.57</b>	<b>1.59</b>

**Source: Research Data (2021)**

Table 4.8 shows timely delivery of procured items with a mean of 3.50 and a SD of 1.49 and reduced delivery lead time with a mean of 3.51 and SD of 1.45. Minimized duration of the tendering and sourcing process had a mean of 3.67 and SD of 1.67 and reduced product/service requisition time had a mean of 3.59 and S.D of 1.60. This implies that electronic reverse auction influences timeliness of multinational pharmaceutical corporations to a large extent as affirmed by the overall score (M=3.57, SD=1.59). The findings align with that Radovan et al. (2020) who ascertained that electronic reverse auction minimizes lead time and delivery time. Zhang, et al. (2017) affirmed that electronic reverse auctions reduce tendering time as well as the entire procurement process duration. Reitsma, et al. (2020) observed that the overall procurement time should be shorter upon the adoption of electronic reverse auctions. In comparison, the traditional stagnant bidding may vary from weeks to across months (Delina, Senderáková, Olejárová & Macik, 2019), while the online reverse auctions may last for only half an hour to an hour.

### 4.5.3: Electronic reverse auction and dependability

Table 4.9 shows the ratings of dependability upon the implementation of electronic reverse auction by multinational pharmaceuticals corporations in Kenya.

**Table 4. 9 Electronic reverse auction and dependability**

<b>Dependability</b>	<b>Mean</b>	<b>Std. Dev</b>
Better quality products and services that can be depended on	3.41	1.58
Predictable duration of procuring products and services	3.39	1.69
Improves buyer-supplier relationship leading to reliable suppliers	3.28	1.86
Dependable procurement and tendering process	3.57	1.48
<b>Overall score</b>	<b>3.41</b>	<b>1.69</b>

**Source: Research Data (2021)**

From table 4.9, a mean of 3.41 and SD of 1.58 was attributed to better quality products and services that can be depended on while the mean of 3.39 and SD of 1.69 was attributed to predictable duration of procuring products and services. Improved buyer-supplier relationship leading to reliable suppliers (M=3.28, SD=1.86) and dependable procurement and tendering process had a mean of 3.57 and SD of 1.48. The overall score shows a mean of 3.41 and SD of 1.69, an indication that dependability was influenced by the implementation of electronic reverse auction by the multinational pharmaceutical corporations in Kenya to a moderate extent. The outcome is contradictory to that of Delina et al (2019) who found that electronic reverse auctions improves relationships between suppliers and the firm through collaborations as well as having dependable suppliers. Hanák et al. (2020) adds that electronic reverse auction also enhances the productivity of quality products and services.

### 4.7 Electronic reverse auction and procurement performance.

The study wanted to find out the correlation that exists between electronic reverse auctions and procurement performance. Information was regressed and the results are subsequently discussed.

**Table 4. 10 Regression Model Summary**

<b>Model</b>	<b>R</b>	<b>R square</b>	<b>Adjusted square</b>	<b>R Std. Error of the Estimate</b>
<b>I</b>	.809	.759	.639	.271

a. Predictors: (Constant), electronic reverse auction

b. Dependent Variable: procurement performance

**Source: Research data (2021)**

From table 4.10, the  $R^2$  is 0.759 which upon conversion becomes 76% meaning that 75.9% of procurement performance was due to the adoption of electronic reverse auctions (Access to global suppliers, competitive prices, level playing field). This is a modest fit as other factors only contribute to 24.1% of procurement performance in the multinational pharmaceutical corporations in Kenya.

Table 4.11 demonstrates the outcome of ANOVA analysis.

**Table 4. 11 ANOVA analysis**

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>1</b> Regression	6.091	2	3.409	13.043	.001 <sup>b</sup>
Residual	0.461	51	0.142		
<b>Total</b>	<b>6.552</b>	<b>53</b>			

a. Dependent Variable: Procurement performance

b. Predictors:(Constant), Access to global suppliers, competitive prices, level playing field

**Source: Research data (2021)**

The analysis of variance is significant as indicated by the F value of 13.04 which is greater than the mean of 3.41. The outcome is corroborated by the p value of 0.001 that is lower than 5% a confirmation that the model is significant.



The P value of lower than 5% ( $0.001 < 0.05$ ) implies that electronic reverse auction has a statistically noteworthy correlation with procurement performance in the multinational pharmaceutical corporations in Kenya.

Tabulated in 4.12 is the coefficient analysis showing the individual independent variable's influence on procurement performance.

**Table 4. 12 Coefficients Analysis**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	9.049	1.453		3.530	0.030
Access to suppliers	0.493	0.424	0.434	1.058	0.024
Competitive prices	0.314	0.426	0.742	0.535	0.031
Level playing field	1.635	0.853	0.328	1.509	0.011

**Source: Research Data (2021)**

The linear regression equation thus becomes:

$$Y = 9.049 + 0.493X_1 + 0.314X_2 + 1.635X_3$$

**Where**

Y = Procurement performance

X<sub>1</sub>= Access to global suppliers

X<sub>2</sub>= Competitive prices

X<sub>3</sub>= Level playing fields

From table 4.12, electronic reverse auction (access to global suppliers (t=1.058, P<0.05), competitive prices (t=0.535, P<0.05) and level playing field (t=1.509, P<0.05) all have an affirmative and substantial correlation with procurement performance.

The model indicates that when access to global suppliers, competitive prices and level playing field are sustained at zero, procurement performance value becomes 9.05. Nonetheless, maintaining other predictors constant, one unit change in access to global suppliers would amount

to a 0.49 upsurge in procurement performance, one unit change in competitive prices would amount to a 0.314 rise in procurement performance and one unit change in level playing field would result to a 1.635 growth in procurement performance.

From the aforementioned outcome, electronic reverse auction (access to global suppliers, competitive prices and level playing field) was determined to have statistically affirmative correlation with procurement performance (cost, timeliness & dependability) of multinational pharmaceutical corporations in Kenya. The findings are aligned with that of Oh (2021) who found out that the adoption of electronic procurement through e-reverse auctions allows for the reduction of costs, errors in processing and time and reduces purchasing prices. Hanák, Marović and Jajac (2020) posit that the enhancement of Procurement Performance through Electronic reverse auctions methodologies continues to shape firms' supply chain competitiveness and performance.

The use of Electronic reverse auctions leads to considerable gains, for instance the ability to outperform competitors by reducing the cost of tendering process and getting the best prices through a transparent process (Zhang & Liu, 2021). Hanák et al. (2020) add that the process also eliminates corruption and coercion on awarding tenders and promotes fair competition among all bidders. Wohlgezogen, Hofstetter and Hamann (2020) conclude that electronic reverse auction enhances cost reduction, timeliness, dependability, and quality and increases efficiency.

#### 4.8 Challenges of implementing electronic reverse auction

The study also aimed at establishing the challenges faced by the multinational pharmaceutical corporations in the adoption of electronic reverse auctions and table 4.13 points out the outcome.

**Table 4. 13 Challenges of implementing electronic reverse auction**

<b>Electronic reverse auction challenges</b>	<b>Mean</b>	<b>Std. Dev</b>
High initial cost of setting up Electronic Reverse Auction system	3.74	1.28
System/software running, and upgrade costs are high	3.63	1.46
Disruptions due to technical hitches	3.43	1.76
Risk of non-ethical behaviors e.g., supplier collusion, phantom bidding, price undercutting	3.49	1.58

Competitive priorities like quality, reliability, delivery and timing, flexibility, and technological competences can be switched for minimal prices.	3.61	1.49
Risk of destroying trust and shared pendency between the focal firm and core strategic vendors.	3.48	1.59
Illiteracy in ICT and use of Electronic Reverse Auction by buyers and suppliers	3.42	1.67

**Source: Research Data (2021)**

Table 4.19 indicates some of the challenges faced in the implementation of electronic reverse auctions. High initial cost of setting up Electronic Reverse Auction system (M=3.74, SD=1.28), System/software running and upgrade costs are (M=3.63, SD=1.46) and competitive priorities like quality, reliability, delivery and timing, flexibility, and technological competences can be switched for minimal prices (M=3.61, SD=1.58) were found to inhibit the implementation of electronic reverse auction to a large extent. Disruptions due to technical hitches (M=3.49, SD=1.58), risk of non-ethical behaviors e.g., supplier collusion, phantom bidding, price undercutting (M=3.61, SD=1.49), risk of destroying trust and shared pendency between the focal firm and core strategic vendors (M=3.48, SD=1.59) and Illiteracy in ICT and use of Electronic Reverse Auction by buyers and suppliers (M=3.42, SD=1.67) were all experienced to a moderate extent.

The outcome agrees with the literature as based on Pawar et al. (2017) who identified that amongst the leading challenges faced in the implementation of ERAs are the cost associated with the set up as well as the maintenance of the systems and software. Marei, et al. (2021) recognizes lack of top management support and disruptions during the process to be a hindrance towards implementing electronic reverse auctions. Ngatman, et al. (2020) on the other hand points out that the auctions are faced with supplier collusion, phantom bidding and price undercutting thus making them not to be as effective as they should have been. Users not being aware of how the system works (illiteracy), lack the necessary training in using the systems and damaging of existing good relationship with strategic suppliers have also been found to be among the main challenges faced by firms in the implementation of electronic reverse auctions (Hanák et al., 2020; Ngatman, et al., 2020; Marei, et al., 2021)

## **CHAPTER FIVE:**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

The summary, conclusions, recommendations and suggestions for future studies, all of which have been derived from the study's objectives, are subsequently discussed.

#### **5.2 Summary of Findings**

This section summarizes the findings as per the questions posed by the researcher. The first objective was to determine the level of adoption of electronic reverse auctions by the multinational pharmaceutical corporations in Kenya with the second one being to ascertain the correlation between electronic reverse auction and procurement performance of multinational pharmaceutical corporations in Kenya.

On the extent of adoption, the multinational pharmaceutical corporations had adopted access to global suppliers, competitive prices and level playing field to a large extent. Access to global suppliers was adopted by the multinational pharmaceutical corporations' inviting a variety of suppliers to participate in the auctions, carrying out education and trainings to all suppliers, providing clear specifications to all suppliers, carrying out supplier selection based on merit and early supplier engagement. Competitive prices were also adopted to a large extent through sharing of vital information with key suppliers, inviting a big number of vendors to spur a competitive auction, allowing suppliers to compete based on the prices and collaborating with the suppliers to enhance competition by the multinational pharmaceutical corporations in Kenya as indicated by the mean and deviations. Level playing field was adopted to a large extent by the multinational pharmaceutical corporations in Kenya giving equal opportunities to all suppliers, sharing information simultaneously to all the involved suppliers, standardizing the duration of the reverse auctions and same application of auction rules to all suppliers, simultaneous training of all suppliers prior to the auctions on how to participate and providing all suppliers with precise and uniform description of the products or services to be supplied..

On the individual measures of procurement performance, adoption of access to global suppliers, competitive prices and having a level playing field were found to influence cost, timeliness and dependability of procurement in the multinational pharmaceutical corporations. The general outcome affirms that the adoption of access to global suppliers, competitive prices and having a level playing field influenced procurement performance. Therefore, the adoption of electronic reverse auctions has an affirmative and noteworthy correlation with procurement performance of the multinational pharmaceutical corporations in Kenya.

Regarding the challenges encountered in the implementation of electronic reverse auctions by the multinational pharmaceutical corporations in Kenya, it was noted that high initial cost of setting up, high cost of maintenance, lack of support from the top management, ICT illiteracy, disruptions due to technical hitches, risk of destroying trust between the firm and its strategic suppliers were found to be among the key challenges encountered in the implementation of electronic reverse auction.

### **5.3 Conclusion**

The results of the study in the previous chapter have led to the conclusion that there exists an affirmative correlation between electronic reverse auctions and procurement performance of the multinational pharmaceutical corporations in Kenya. Electronic reverse auctions were found to influence procurement performance through cost, timeliness and dependability.

The first objective which was to determine the level of adoption of electronic reverse auctions was achieved as it was established that the multinational pharmaceutical corporations had adopted access to global suppliers, competitive prices and having level playing fields to a large extent. The second objective which was to determine the correlation between electronic reverse auctions and procurement performance was also achieved as the adoption of access to global suppliers, competitive prices and having a level playing field were found to influence cost, timeliness and dependability. Generally, it was found that electronic reverse auction influences procurement performance of the multinational pharmaceutical corporations in Kenya. The third objective set to establish the challenges encountered in implementation of electronic reverse auctions by the multinational pharmaceutical corporations. Among the key challenges identified were high initial

cost of setting up, high cost of maintenance, lack of support from the top management, ICT illiteracy and disruptions due to technical hitches.

#### **5.4 Recommendations form the study**

Based on the findings of the study, it is recommended that the multinational pharmaceutical corporations in Kenya should embrace electronic reverse auction if they are to enhance their procurement performances through cost minimization, timeliness and dependability. The study recommends that the firms should keep up with accessing global suppliers and having transparency in their procurement processes as it has been found to largely influence procurement performance. Having a global pool and selection of qualified suppliers can aid a firm come up with quality products and provide better services. All the suppliers in the electronic reverse auctions are given equal opportunities and are selected based on their merits irrespective of their geographical locations which stimulates competition as well as enhancing the quality of products and services because only the most qualified suppliers are selected.

Another recommendation is that firms should adopt electronic reverse auctions through competitive prices as it allows suppliers to competitively bid therefore reducing their selling prices to an optimal point where a true market price is reached. Competitive prices are also enhanced as each bidding supplier can be able to view the bids of other suppliers and therefore lower their bids to arrive at the most competitive price. Information sharing with all suppliers participating in the electronic reverse auctions also enhances the competitiveness of prices given by the suppliers. The root cause for implementation of electronic reverse auctions is so as to acquire best deals in the most competitive way possible and thus the more reason why its adoption is recommended.

There is also need to have a level playing field for all suppliers during tendering. Through electronic reverse auctions, suppliers are able to see the submitted bids by their counterparts during the entire auction period in real-time. This provided a high degree of visibility among the suppliers based on their competitors' actions thus the visibility enhances a level playing field for all. All the suppliers in the electronic reverse auctions are given equal opportunities and are selected based on their merits irrespective of where they are located. This thus provides a large pool of suppliers as well as enhances competition. The quality of product is also boosted as only the most qualified suppliers are selected and thus it is recommended that the multinational pharmaceutical

corporations adopt having a level playing field for their suppliers during tendering to enhance their procurement performance.

Based on the challenges which have been found to hinder the implementation of electronic reverse auctions, it is recommended that training and education be carried out to both employees and suppliers to avert the ICT illiteracy, awareness to be carried out on the relevance of electronic reverse auctions to enhance top management support, and on cost, it should be noted that the initial set up cost may be high but the long-term benefits are worth it.

### **5.5 Suggestions for Further Research**

Future studies can focus on the driving factors of implementing electronic reverse auctions by the multinational pharmaceutical corporations in Kenya. Since the study only focused on accessing global pool of suppliers, competitive prices and having a level playing field, future research can focus of other electronic reverse auction strategies apart from this.

It is also suggested that other studies can focus on combining primary and secondary data as a different methodology to see if the outcome will be the same as the current study which only relied on primary data. Other studies can change the context from multinational pharmaceutical corporations and cover other local pharmaceutical manufacturing firms to see if the outcome can be the same or there will be any changes from the results.

Lastly, future studies can add other variables as the current one only relied on the dependent and independent variables. Intervening and moderating variables can be introduced in the future studies and their effects on the findings examined.

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## APPENDIX 1: INTRODUCTION LETTER



### UNIVERSITY OF NAIROBI COLLEGE OF HUMANITIES & SOCIAL SCIENCES FACULTY OF BUSINESS AND MANAGEMENT SCIENCES

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04 November 2021

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

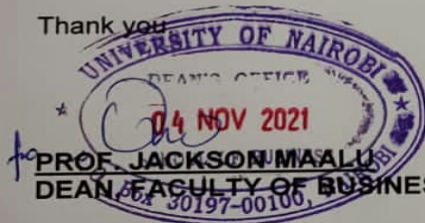
**INTRODUCTORY LETTER FOR RESEARCH  
BRIAN SYEMA MAJANGA – REGISTRATION NO. D67/6589/2017**

This is to confirm that the above named is a bona fide student in the Master of Science in Supply Chain Management (MSc. Supply Chain Management) option degree program in this University. He is conducting research on *"Electronic Reverse Auctions and Procurement Performance in Multinational Pharmaceutical Corporations in Kenya"*.

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the research project. The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your assistance will be highly appreciated.

Thank you



**PROF. JACKSON MAALU  
DEAN, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES**

## APPENDIX I1: QUESTIONNAIRE

The study is on ascertaining the relationship between Electronic Reverse Auctions and procurement performance in Multinational Pharmaceutical Corporations in Kenya.

### SECTION A: Background Information

1. Name of your organization .....

2. Which department/function do you belong to?

- a) Procurement ( )
- b) ICT ( )
- c) Supply Chain ( )

3. What position do you currently hold in your organization?

- a) Top Management ( )
- b) Middle Level Management ( )
- c) Operational Staff ( )
- d) Other (Specify if applicable) .....

4. Period of service in your multinational pharmaceutical corporation?

- a) 1 – 2 years ( )
- b) 3 – 5 years ( )
- c) 5 -10 years ( )
- d) Over 10 years ( )

5. How long has your organization been in operation in Kenya?

- a) Less than 5 years ( )
- b) 5 – 10 years ( )
- c) Over 10 years ( )

**SECTION B: Extent of Adoption of Electronic Reverse Auctions**

6. Subsequently listed are among the Electronic Reverse Auction adopted by entities. kindly rate the extent of adoption of each.

a) Does your organization have an in-house Electronic Reverse Auction system/solution/software? (Tick where appropriate)

Yes ( ) No ( )

b) Do procurement employees directly run/conduct Electronic Reverse Auction in your organization? (Tick where appropriate)

Yes ( ) No ( )

c) Has your organization outsourced to a third-party service provider the running of Electronic Reverse Auction? Tick where appropriate)

Yes ( ) No ( )

d) Please rank on a scale of 1-5; (1- very small extent, 2 - small extent, 3- medium extent, 4 - large extent and 5 - very large extent).

<b>Access to global suppliers</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The firm has access to a wider variety of suppliers					
The firm carries out education and trainings to all suppliers					
The firm provides clear specifications to all suppliers					
The firm carries out supplier selection based on merit					
The firm carries out earlier supplier engagement					
<b>Competitive Prices</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The corporation shares vital information with key suppliers					
The corporation lets suppliers compete based on the prices					
The firm provides a big number of suppliers to generate a competitive surrounding					
the firm collaborates with the suppliers to enhance competition					

<b>Level playing field</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The firm gives equal opportunities to all suppliers					
Information is shared simultaneously to all the involved suppliers					
Duration of the reverse auction is standard, and all the rules are applicable to all suppliers					
All suppliers are simultaneously trained prior to the auction on how to participate					
We provide all suppliers with precise and uniform description of the product or service to be procured					

Others

.....  
 .....

**SECTION C: Performance outcomes of adopting Electronic Reverse Auction**

7. Subsequently listed are procurement performance indicators that entities experience upon implementation of electronic reverse auction. Kindly rate your agreement level with the indicators by using a scale of 1-5; (1- very small extent, 2- small extent, 3- medium extent, 4- large extent and 5- very large extent).

<b>Cost</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Overall cost of procuring items has reduced					
Cost of tendering process has decreased					
Results in competitive prices					
Improved transparency thus reduced corruption related costs					
Reduced cost of labour as less employees are needed					
Reduced travel and postage costs					
Reduced Total Cost of Ownership (TCO)					



<b>Timeliness</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Procured items are delivered on time					
We have experienced reduced delivery lead time					
Reduced duration of the tendering process					
Reduced duration of sourcing process					
Responsive suppliers in case of emergency					
Reduced product/service requisition time					
<b>Dependability</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Better quality products and services that can be depended on					
Predictable duration of procuring products and services					
Improves buyer-supplier relationship hence suppliers can be relied on					
Customer satisfaction					
Enhanced integration and trusted system that works seamlessly					
Increased transparency of entire sourcing process					

Others

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**SECTION D: CHALLENGES ENCOUNTERED IN IMPLEMENTATION OF ELECTRONIC REVERSE AUCTIONS BY MULTINATIONAL PHARMACEUTICAL COMPANIES IN KENYA**

Given below are statements on challenges experienced by Multinational Pharmaceutical Corporations in Kenya in implementing Electronic Reverse Auctions. Kindly rank the extent that you agree with the indicators using the five-point Likert scale where 1=strongly disagree and 5=strongly agree.

<b>Statements</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
High initial cost of setting up Electronic Reverse Auction system/solution					
System/software running costs are high					
System upgrades/enhancements are costly					
Disruptions due to technical hitches					
Risk of non-ethical behaviors e.g., supplier collusion, phantom bidding, price undercutting etc.					
Illiteracy in ICT and use of Electronic Reverse Auction by buyers and suppliers					
Inadequate training of employees and suppliers on how to use Electronic Reverse Auction					
Lack of sufficient ICT infrastructure					

Others (please specify)

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*Thank you*

**APPENDIX III: LIST OF MULTINATIONAL PHARMACEUTICAL COOPERATIONS  
IN KENYA**

1. Abbot	19. Kulal International Ltd
2. Adcock Ingram	20. Laborex Pharma
3. Allergan	21. Mac Naughton
4. AstraZeneca	22. Medisel
5. Aurobindo	23. Medox
6. Bayer East Africa Ltd	24. Menarini
7. Beta Health International	25. Merck Serono
8. Boehringer Ingelheim	26. Merck Sharp & Dohme (MSD)
9. Cipla	27. Novartis Pharmaceutical Corporation
10. Ella Lilly	28. Novo Nordisk
11. Europa	29. Pan Pharmaceuticals
12. Getz	30. Pfizer Inc.
13. GlaxoSmithKline Pharmaceuticals Kenya Ltd	31. Roche Pharma Ltd
14. Glenmark	32. Sanofi Avensis Ltd
15. Harleys Ltd	33. Servier Laboratories Ltd
16. Highchem ltd	34. Sun Pharmaceuticals
17. Jansen	
18. Johnson & Johnson	

**Source; Pharmacy Poisons Board (2019)**