



UNIVERSITY OF NAIROBI

**FACTORS AFFECTING IMPLEMENTATION OF STRATEGIC E-PROCUREMENT
OF CONSTRUCTION MATERIALS FOR MAINTENANCE WORKS**

A Study of Private Hospitals in Nairobi City County

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Arts in construction management in the university of Nairobi.**

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DECLARATION

I Joel Muli Mumo sincerely declare that this research project is my original work and has not been presented for the award of a degree in any other university.

Signature.....

Date.....

This project has been submitted for examination with my approval as university supervisor.

Raphael M. Kieti

Signature

Date.....

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DEDICATION

First to the almighty God for everything and to my dear family, for the unequalled support and encouragement.

ABSTRACT

Building maintenance is usually a requirement due to the use of the structure. Hospitals are not an exception in this, as there is a requirement to ensure comfort and ambience for those in such premises. There is a strong feeling that at the moment, there is a researchable gap to address the situation on ground regarding the optimum management of procurement of materials for maintenance purposes in private hospitals in Nairobi City County.

The old ways of procurement have been practiced for long, but the world is fast moving out of this form of procurement and embracing new trends such as E-Procurement. This is in a bid to achieve timeliness, Quality, and Cost effectiveness.

Hospitals have not fully embraced E-procurement practices and this makes them fail to benefit from the advantages it offers, resulting into long turnaround times in correcting maintenance related problems and eventually having customers disgruntled, due to uncomfortable hospital conditions.

The intention of this study was to find out the procurement methods that are in use in procurement of Materials for Maintenance Work in Private Hospitals located within Nairobi City County. It explored the most preferred method(s) of procurement of materials for Maintenance works and investigated the challenges facing the implementation of E-Procurement of materials for Maintenance works in private hospitals in Nairobi City County. Study research proposition was “E- Procurement is the most preferred system of procurement of materials for Maintenance works in Private Hospitals within Nairobi City County”. Use of questionnaires emailed, emailed to these hospitals, was the main method for data collection, out of which only 39 responded. It was clear that there are several methods of procurement for construction materials in the Nairobi City County, and most of them most procuring based on needs and not pre-planned. The

study also found that there were several challenges that faced the strategic implementation of E-procurement of construction materials for maintenance works such as lack of training, awareness about e-procurement especially within the hospital suppliers was also wanting. It also found out that most private hospitals do not implement E-Procurement especially for maintenance construction materials procurement. The study therefore recommends continuous review of procurement management policies, enhancement of internet connectivity, awareness of E-Procurement to be enhanced, training, and employment of the right professionals in procurement and maintenance departments. Levels of awareness of maintenance programming among facilities managers in these.

It identifies several areas for further study such as research on available computer-based maintenance systems in use for maintenance in institutions, the Level of Maintenance Programming Training in Private Hospitals in Kenya in Kenya, the Level of internet connectivity among construction materials suppliers and its relationship with the type of methods adopted for procurement of materials from these suppliers in Nairobi

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List of Acronyms

BDC: Business Development Bank of Canada.	13
BS: Bristish Standards	16
Capex budget: Capital Expenditure Budget.	18
CIPS: Chattered Institute of Purchasing and Suppliers.	23
CS: Corporate Strategy.	25
ERP: Enterprise Resource Planning.	14
GDP: Gross Domestic Product.	19
GE: Green Economy.	19
ICT: Information and Communication Technology	12
IT: Information Technology.	27
JIT: Just In Time.....	7
JKUAT: JomoKenyatta University of Agriculture and Technology.....	i
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LPOs: Local Purchase Orders.....	36
MRO	17
MRO: Maintenance Repair and Overhaul.	15, 17
NaCoSTI: National Commission for Science, Technology and Innovation.	ii
NHIF: National Hospital Insurance Fund.....	12
OEM: Original Equipment Manufacturing.....	19
PPDA: Public Procurement and Disporsal Act	13
PS: Procurement Strategy.	25
RICS: Royal Institution of Chattered Surveyors	6
SCP: Sustainable Consumption and Production.....	22
SD: Sustainable Development.	22

SPP: Sustainable Public Procurement. 19

UK: United Kingdom. 22

UN: United Nations 8

UNEP: United Nations Environment Programme..... 19

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CHAPTER ONE:

1:0. INTRODUCTION

1:1. Background of the study

After any building structure is put up, its Sanitary Environment maintenance becomes a requirement due to the use of the structure. Hospitals are not an exception in this, as there is a requirement to ensure comfort and ambience for those in such premises.

Maintenance cycles for hospitals are required to meet high standards due to issues of infection control, access by patients, due to certain Maintenance restrictions for instance the need to use access equipment such as wheel chairs, and ease of operation for the health workers among other reasons. The cycle for health institutions' buildings maintenance is quite frequent as compared to residential or commercial buildings; this is due to sensitivity of healthcare as a core business issue. The hospital must meet certain health standards for customers to trust the hospital, as enhanced by the comfort standards. This is common in major hospitals in Nairobi, where this study will focus. It study will focused on private hospitals within Nairobi City County (NCC).

Procurement of materials for maintenance works, especially in hospital settings, plays an important operational role and it occurs quite often. Therefore, there is need to ensure that certain objectives are met through the procurement procedures. These are **Quality** i.e. ensuring the right quality of the material is obtained such that there is value for money. There is also need for **Costs** management, such that the affordability aspect is balanced to ensure that less expensive items are bought, ensuring that the functionality is balanced with the cost aspect. **Timeliness** is

also important in procurement of materials to ensure restoration of the structure without delay and that customers do not suffer from delays.

Traditional procurement which involves physical travelling to stores for sourcing of materials, with hardcopy communication devoid of networked computer-based communication, has been practiced for a long time but the world is fast moving out of this form of procurement, and embracing new trends such as E-Procurement. This is in a bid to achieve Timeliness, Quality, Cost effectiveness in a hospital set up.

1:2. Problem Statement

Hospitals have special needs in terms of procurement due to their special needs such as frequency of buildings maintenance in a bid to ensure good health care. This fast-paced modern maintenance method generally motivates this research in a way that the turnaround time is put into consideration, among other factors, such as quality, variety and cost of each maintenance material item.

Procurement of construction maintenance materials for hospitals has overtime followed the traditional method which is beset with several problems such as lack of a wide market hence prompting the use of the only available materials. This made costs of procurement to be high due to travelling costs to the stores, idle labor due to lack of materials to work on, lost business due to delay, a lot of paperwork, among others.

There is a new method of procurement, E-Procurement which is suited for hospitals given their special circumstances and the advantages that this method offers. Among these advantages

include; Less paperwork since most data is done electronically, less travelling costs since searching for materials can be done in the internet via companies' websites, Minimal idle labor since orders can be planned in time etc.

Hospitals have not fully embraced E-procurement practices and this makes them fail to benefit from the advantages it offers, resulting into long turnaround times in correcting maintenance related problems and eventually having customers disgruntled, due to uncomfortable hospital conditions.

1:3. Study Objectives

- i. To identify which planning methods are in use in procurement of Materials for Maintenance Work in Private Hospitals within the Nairobi City County.
- ii. To find out the most preferred method used in procurement of materials for Maintenance works within Private Hospitals in Nairobi City County.
- iii. To find out which challenges face the implementation of E-Procurement of materials for Maintenance works in these hospitals.

1:4. Research Questions

- i. Which planning methods are in use in procurement of Materials for Maintenance Work in Private Hospitals within the Nairobi City County?
- ii. Which is the most preferred method used in procurement of materials for Maintenance works within Private Hospitals in Nairobi City County?

- iii. What are the challenges that face the implementation of E-Procurement of materials for Maintenance works in these hospitals?

1:5. Proposition

The most preferred system of procurement of materials for Maintenance works within Private Hospitals in Nairobi City County is through Electronic method.

1:6. Significance of the Study

Knowledge of the available procurement methods in use in procurement of Materials for Maintenance Work in selected Private Hospitals in Nairobi City County, will make it known whether the E-Procurement system is strategically in use, in this area and locality of study.

Knowledge about the most preferred method of procurement of materials for Maintenance works in selected Private Hospitals in Nairobi City County, will make it possible to propose a method which works. It will inform the research whether a hybrid system of procurement is required. It will further inform the research whether E-Procurement is preferred or not.

Knowing the challenges facing Electronic Procurement implementation of maintenance works materials in the aforementioned private hospitals, will make it possible to propose possible areas of future study as this will identify other research gaps to be filled.

1:7. Study Assumptions

The following were the assumptions made for the study:

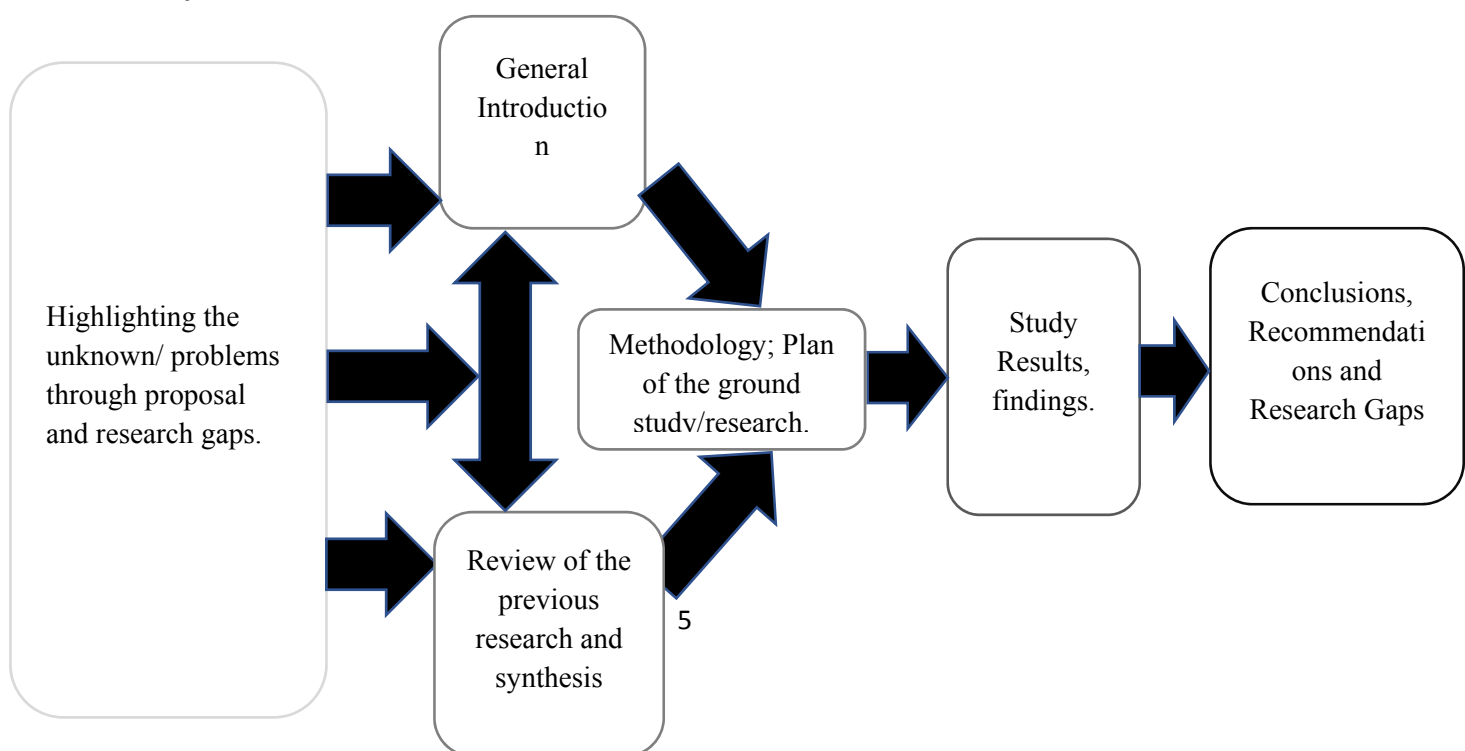
- (1) All hospitals have some sense of maintenance for their facilities even if not structured.

(2) Maintenance supported by Electronic nature of procurement for maintenance materials, would be better than the traditional nature of procurement for maintenance materials.

1:8. Study Limitations and Delimitations

- **Time Constraint:** With laid down events program and punctuality, this limitation was managed to some extent.
- **Low Response Rate:** This was managed through better introductory notes in a bid to create rapport before soliciting information. All this was done in confidence to the benefit of the respondents.
- **Subordinate Staff Levels of Education:** This was mitigated through effective selection/sampling of the population. Further, the questions were elaborated, and the questions posed were clarified where necessary.
- **Availability of previous Research:** This assisted in knowing the gaps and getting the general expectations while doing the research.

1:9. Study Structure.



1:9. Chapter one Summary

The study was based on the research gap and problem that the procurement of maintenance materials within the private hospitals in the City County of Nairobi was not up to the challenge. This was based on previous research documented through review of previous literature done by others before, through study of the previous research.

In Chapter three, the plan of how to conduct the research was done leading to chapter four which documented the actual findings on ground. This was later used to make conclusions, and future research needs.

CHAPTER TWO:

2:0. REVIEW OF LITERATURE

2:1. Introduction

This is based on outlining some of the related research done earlier, which is related to the same problem. This doesn't mean that all that was related was all documented, but what led to the understanding of some of the terms, methodologies and general knowledge about Maintenance procurement based on Electronic support, was extensively sought.

Abdi (2012), explains that, electronic procurement is nowadays a significant method in many companies due to the increasing tendency towards purchasing items not found within the organization.

For Electronic driven Procurement to succeed, good prior planning and management is a prerequisite. Thus, the dictum; 'failing to plan is planning to fail'. It is further true that good control and management of whatever activity is important up to the final sub activity; if any better results are to be realized. These entire requirements are crucial in the smart implementation of procurement driven electronically.

2:2: Definition of Terms

a) Maintenance

The Royal Institution of Chartered Surveyors (RICS), (2009) explains that maintenance of buildings regarded as the 'Cinderella' of the building industry for long, where by innovation and 'free thinking' in the delivery of its service is very minimal. RICS further points out that through

the maintenance of buildings sustains environment, creates environment and economic growth is also realized.

The definition as per British Standard Glossary of Terms (3811:1993) is that through the combination of all technical as well as the administrative actions, without forgetting the need for supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function, entails maintenance.

b) Procurement

Lysons, (2003) points out that in a bid to acquire resource inputs the following activities are involve components such as; purchase of fuel, raw materials, energy, sub-assemblies, and consumable plus merchandise items. All these coming from external sources.

c) E- Procurement

Corsi, (2006) in a bid to define electronically driven procurement effort to conduct transactions using the internet for transactions between supplier and their awarding authorities. Initial identification of an obligation, through tendering process, up to imbursement and possibility of the agreement supervision.

d) Just In Time

Using the necessary minimum resources to produce and/or deliver only the necessary parts where by this is usually done within the necessary time, and quantity, entails the Just in Time philosophy as per the Toyota System Hand Book.

e) Sustainability

The Brundtland commission report (1987) defines Sustainable Development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Philip (2014) reiterates that the word 'Sustain' from which the word 'sustainability' has been derived, has remained in the language for long. This is derived from the Latin *sustenare* with a connotation "to hold up" i.e. to back up. It then changed way before to mean to reserve something going or extend its period, with an implication of ensuring the support or necessities that made the extended duration possible e.g. a sustaining meal. In the modern world, for shared non-specialized use of the word the nearby synonym is 'maintain'.

Sustain and its spin-offs (e.g. sustainability, sustainable, sustaining) were first used in a micro or particular context. Though, numerous hundreds of years before the Swiss and Germans conceived a form of forestry planned to keep the forest working as prolific systems over the very long term and this was called, in the English-speaking world, sustainable forestry. This impression was then protracted to sustainable fisheries.

From there it was not such a big step for the term to be practical, throughout the 1960s and 70s, in the macro context of environmental issues where there was a need to sustain the whole environment and human society. This tradition was conventional by the time of the 1972 UN Meeting on the Human Environment held in Stockholm-Sweden.

His meanings of Sustainability based on strategies for attaining the thing being defined reiterates that (the accomplishment of 'x' necessitates e.g. 'y'); the accomplishment of

sustainability necessitates, for example, the combination of environmental, social and economic issues)

f) Strategy

Various researchers define Strategy differently. To contrast with a view of strategy as scheduling Henry Mintzberg explains that strategy as "a design in a stream of conclusions". Max McKeown (2011) argues that "strategy is about determining the imminent" and is the human attempt to get to "required ends with accessible means".

Vladimir Kvint (2009), defines strategy as "a scheme of discovering, framing, and evolving a principle that will guarantee long-term achievement if followed devotedly.

Robert (2010) describes that at its maximum basic and broad level, then, strategy may be defined as a proposal, technique, or sequences of schedules for finding a explicit goal or projected outcome. He further says that there are basically four different classes into which most strategies fall. While they differ in scope and methodology, they are all “genuine” in the sense that they can, if appropriately established and managed, permit the organization to achieve its aim.

According to him, these four categories are:

- **Planned /Designed Strategy**

This is predicted plan of strategy. Inscribed, with a strong, programmed purpose that is recognized and linked to all the persons within a group. It leaves no query as to what the team is on as compared to the rest of strategy.

- **Adaptive Strategy – Changing with Situation.**

It changes over time in retort to pressures inside and outside a team as compared to the intended/planned strategy. Here the strategies grow through a continuing course of experimental nature with the procedure usually commencing with a loose scenario representing how to best exploit the company's resources. Even the planned aims can be transformed if some new force or influence strains it. Where change is fast, normal and concerted, like in the software advancement adaptive strategy is very suitable due to their fluid nature. Initiated and curving from the management that is neighboring to the clientele, Adaptive strategies work best when they are "bottom-up" motivated.

- **Outlined/Framed Strategy**

In contrast to both adaptive and planned strategies, outlined strategy consists of set of actions with minute or no detail. Rather than a definite path, an outlined strategy normally starts out with a set of initiatives – slakly distinct actions which need persons to control their *own* sequence to accomplish the anticipated outcome. It most likely may never achieve results since there isn't much guidance in an outlined strategy, except when it is altered into either a planned or adaptive strategy.

- **Performed/Executed Strategy**

On condition that it is realizing the envisioned result, there is nothing further within a performed strategy. A performed strategy is simply a prearranged or adaptive strategy that has molded a

reliable shape of achievement or performance over time. In other words, a performed strategy is done, it's finished, and it's been integrated into the organization's way of doing things.

It is true that together, policy and diplomacies link the slit between ends and means; according to Nickols, (2012). He further reiterates that the perception of strategy has been presumed from the armed forces and adapted for commercial use. From renowned authors, on what they have to say, is that it is true that the adaption was diffident. In commercial world, as in the armed forces, strategy links the slit amid strategy and diplomacies.

g) Electronic based Strategy (E-Strategy)

Najib (2012 et al), defines Strategy which is supported electronically as the course used to appraise and develop the Information, Communication Technologies (ICT) incorporation in a state. It is true that the procedure encompasses: the analytical phase named which assesses ICT set-up and its use in a nation, Electronic Policy construction phase which conveys out the description of how to grow the analytical phase, the third phase is usually the operation of this electronic policy. Several approaches are used for electronic policy, but the deficiency of gages measures limits its expansion. Also, there is a lack of electronic Policy construction tactics.

2:3. Analysis and Critique of strategy Literature.

The various strategies according to several researchers show the situations one would expect on ground, depending on the level of planning of any organization. It is a task bestowed upon concerned professionals in strategic implementation of E-Procurement of maintenance materials,

to position their organizations correctly to uphold or advance their stability in terms of strategy formulation and implementation.

2:4. Challenges to Maintenance Procurement

E-Procurement has been implemented to a moderate extent by the NHIF accredited private hospitals in Kenya. Seven Factors that influence e-procurement implementation include: risk perception, end user training, existing technology, top management support, supplier systems integration, implementation strategy and vendor Support, (Nzuve, 2011).

Maintenance has exclusive features particularly for counteractive maintenance which is at no time deliberate and yet it is an alternative which has to be attended to when it happens. This is one of the many encounters faced by Public Institutions posed by Public Procurement and Disposal Act (PPDA), (Mutava, 2014).

She further explains that statutory limitations are evident especially in statutory based buildings' corrective maintenance; other challenges are corruption, slow nature of implementation of the processes, lack of enough data and information concerning what is required for maintenance works to succeed, lack of capacity for supervision and other resources.

2.4.1: Traditional Form of Procurement

Traditional procurement procedure allows notorious eccentric purchasing form which signifies a condition where employees make unintended purchases from non-preferred suppliers at higher costs. It follows that, out of that procurement strategies are not well established and henceforth

assuming the same develops a serious contest; adding that series of officialdom in the procurement procedure give rise to poor service delivery; and finally, procurement is habitually a labor-intensive activity and, as such, administrators spend substantial time on ‘nonvalue-added activities, (Ochieng, 2016).

2:4.2: Mitigation Methods of some of the Challenges

2.4.2.1: E –Procurement.

The following benefits are likely to accrue if an organization uses electronic form of procurement: Les costs on tendering: Invoicing, such as writing, filing by post communication takes lots of time which can be safeguarded if Electronic procurement is used. Therefore members of staff use the ample time for policy making and such. This is because the E-Procurement platform is characterized by speed and cost saving and subcontractor price perceptibility (Mutunga et. al., 2013).

2:4:2.2: Forms of Electronic Procurement

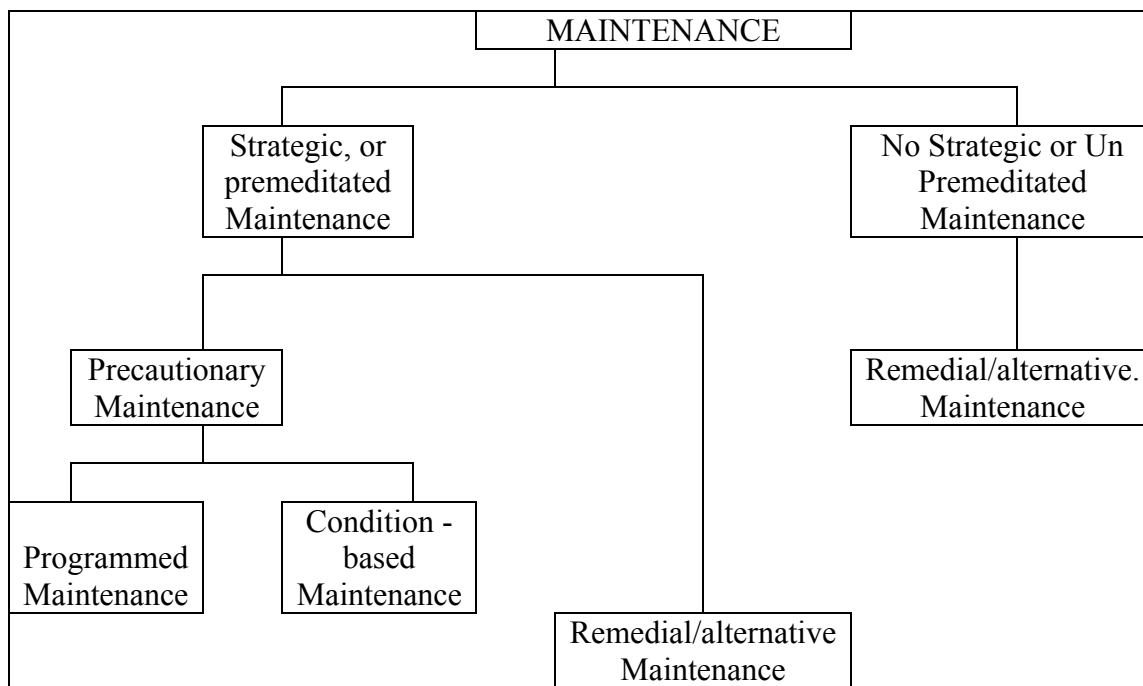
It is worthwhile to note the following main forms of electronic purchasing (Hernandez et. al., 2011):

- **Web-based ERP (Enterprise Resource Planning):** This is whereby the process of creating and approving buying demands, engaging purchase orders and getting goods and services is done through the help of a software structure based on Internet technology.
- **Electronic MRO (Maintenance, Repair and Overhaul):** This is usually similar to web-based ERP but E-MRO deals with non-product related supplies.

- **Electronic sourcing:** By means of Internet technology, new dealers for certain category of buying needs can be found.
- **Electronic tendering:** By means of Internet technology, data and costs from dealers can be gotten after the distribution of such appeals to them.
- **Electronic reverse auctioning:** Goods and Services from several recognized or unrecognized dealers can be sourced through the Internet expertise.
- **Electronic informing:** Within and without the internal realm of an organization, it is possible to gather and distribute procurement information via the abled internet technology.

2:5: Types of Maintenance

Figure 1 – 2 British Standard (BS) 3811 Building Maintenance Classification



Source: BS 3811

BS3811 further explains these types of maintenance as follows:

- **Premeditated/Planned Maintenance:** “The maintenance organized and carried out with anticipation, control and the practice of record keeping to a programmed strategy.”
- **Un Premeditated /Unplanned Maintenance:** “The maintenance carried out to no programmed plan.”
- **Precautionary /Preventive Maintenance:** “The maintenance carried at prearranged recesses or compliant to prearranged criteria and projected to decrease the prospect of catastrophe or the performance dilapidation of an item.”
- **Remedial/Corrective Maintenance:** “The maintenance carried out after a catastrophe has befallen a system and envisioned to reestablish an item to a state in which it can accomplish its required purpose.”
- **Alternative/Emergency Maintenance:** “The maintenance which it is indispensable to put in hand instantly to avoid serious costs.” This is sometimes referred to as day-to-day maintenance, which is triggered by such incidents as gas leaks and gale impairment.
- **Condition-based Maintenance:** “The preventive maintenance usually due to awareness of the working ability of an item from repetitive or incessant monitoring.”
- **Scheduled/Programmed Maintenance:** “The deterrent maintenance permitted to a prearranged interval of time, number of procedures, range, etc.

2:6: Unique requirements of Maintenance Procurement.

2.6.1: Maintenance, Repair Operations (MRO)

Classically, MRO (Maintenance, Repair and Operations) matters account for 80% of the purchasing department staffs duty while accounting for only 20% of the organization’s

purchasing dollars (Gelderman et. al., 2008). Owing to the low impact to total buying income, MRO buying frequently obtains minute management deliberation. It is worthwhile to note that as a result, MRO items incline to be acquired in a clumsy and dispersed way, scarcely ensuring that there is added worth to the company.

2.7: Maintenance Procurement planning

2.7.1: Purchasing planning (Purchase strategy).

Purchasing strategy is the process used by companies or public institutions to plan purchasing activity for a precise period. This is normally accomplished during the accounting process. Each year, administrative sections are charged with the prerogative of accounting for their members of staff, expenditures, and buying needs. This is the first step in the purchasing strategy making course (Ogbal, 2014).

This is usually the same in maintenance departments of any company in the usual Capex budget (Capital Expenditure Budget).

2.8: Just In Time (JIT) Requirements in Maintenance Procurement

2.8.1: Introduction

A point to note is that, price, eminence, enduring gratification etc. are some important issues facing healthcare trade. Continuously, hospitals search for advanced without compromising on the patients' ambience requirements. The Just In Time methodology has proved widely essential in industries like engineering, among many other, to successfully achieve these needs, (Gupta, 2012).

2.8.2: General JIT Concept.

For instance, the Japanese ship industry has benefitted from the JIT interventions as an initial JIT exploration set up, as depicted by the way the ship engineers received their steel; "Just-in-time". The spread of JIT interventions to other manufacturing industries, saw them demand a similar treatment, (Sultan, 2011).

2.8.2: Just In Time (J-I-T) in Maintenance Works

Ben-Daya M. et al. (2000), reiterated that, Due to the emphasis on cost-reduction and customer service, JIT (Justin-Time) has become a very popular concept in logistic control systems. In the current competitive environment with short lead times and on-time deliveries, maintenance management also plays an important role in the optimization of business processes.

2:9: Sustainability issues in Maintenance Procurement

According to the United Nations Environment Program(UNEP), (2012) publication, to aid in driving markets in the innovation direction and sustainability, Public spending, which represents between 15 per cent and 30 per cent of GDP in a given country, can enable green growth and the transition to a Green Economy (GE). Agenda 21 and in Chapter III at the Johannesburg Strategy of Operation as one of the means to realize sustainability, identified Sustainable Public Procurement (SPP) as an important point to reckon with.

The publication, through the various case studies further logged a number of straight economic impressions, such as the sustenance to small business activity in Scotland, the sustenance to resident industries in Costa Rica, or the monetary reserves achieved by the State of Sao Paulo,

Brazil. Indirect impacts, such as tax benefits linked to the employment of disabled people have also been demonstrated.

It came up with a maturity level kind of analysis for Sustainable Public Procurement as adopted below:

Table 1 – 2 Maturity Levels Analysis for Sustainable Public Procurement

Key Elements	Lack of Maturity	Intermediate/Low level Maturity	High level of Maturity
Political willingness	Absence of political will, means that SPP is a low priority.	Availability of a political will to promote /test sustainable public procurement, where initiatives are in the pilot phase and cannot rely yet on a more comprehensive approach (eg, national action plan).	Availability of political will to encourage sustainable public procurement.
Acceptance of a global strategy		SPP activities are accepted without long term standpoints and are not combined in overarching sustainable development or green economy strategies	SPP is part of a more comprehensive approach and embedded in overarching strategies.
Awareness of SPP	Presence of very little cognizance and know how bout the ideas of sustainable public procurement.	Actors involved with sustainable public procurement matters have little experience and skill in that field.	Those in charge have a good skill of sustainable public procurement.
Legal framework	Legal structure do not explicitly endorse the inclusion of environmental and social standards into the procurement procedure	Legal structures partially endorse the presence of environmental and social principles into the procurement procedure	The law endorses the presence of social and environmental principles into the procurement procedure
Monitoring		SPP activities are partially monitored. Impacts of SPP activities are not assessed.	Monitoring structures are initiated.
Market readiness	The supply of green products is limited.	Increasing supply and availability of sustainable goods and services	The offer on the market is solid and standardized.

Source: United Nations Environment Program, 2012.

2.9.1: Why is sustainable procurement important?

In both private and public sectors, there is snowballing pressure from patrons, clients, government and the public to put sustainable procurement into practice. This is as per the instruction to endorse public procurement strategies that inspire growth and distribution of ecologically comprehensive goods and services, by the global summit on sustainable development: In reply to this, Corporate practitioners and Specialists have been very fast to establish strategies and strategies entrenching sustainable development fears; for example, the UK Strategy for Sustainable Consumption and Production(SCP). As a step in the direction of realizing this strategy, the Government put in place the Advisory Committee on Consumer Products and the Environment, (Kalubanga, 2012).

Throughout the working life for products and services, their proportional budgets and paybacks should be put in consideration at the onset of the whole plan for Sustainable public procurement in Government interventions so that the long-term economic viability, minimizes environmental impact and becomes socially responsible when procuring goods, services or works, (The New Zealand Business Council for Sustainable Development Journal, 2009).

2.9.2: Benefits of Sustainable Procurement

The following are some of the benefits of Sustainable procurement:

- **Lessen corporate risk**, Future forecasting.
- **Ensure Cost reserves**, this should be taken in line with the going concern principle of any business; that it should be a practice as long as the business is “alife” i.e. running. Landfills or

pathetic ecological appearances due to waste produced through non-sustainable methods becomes a thing of the past.

- **Foster business image in the marketplace**, as per the values of supply chain management in the society.
- **New markets for goods and services**, without fear of new technology, and new products and services, customers get new markets, and this serves as a benefit for both the customer and the buyer.
- Secure the source of products and services as per the ever-growing ecological regulations. This in turn leads to waste reduction and enhanced resource effectiveness, (CIPS, 2009).

2.10: Strategic issues in Maintenance Procurement.

It is recommended that private hospitals should pursue ways to enhance greater partnership within the industry and with dealers to accelerate the pace of execution of e-procurement. Further, since risk perception is a key driver, hospital associations, the private sector, the government and other stake holders should facilitate empirical studies to be conducted to dispel any myths and to help private hospitals better understand the genuine risks as well as the cost benefit tradeoffs a kin with the adoption and use of e-procurement, (Nzuve, 2011).

Procurement function is of essence as far as the Ministry of Energy in Kenya operations are concerned. Through action plans which are dynamic, the process must be well understood. Valued service delivery in the Ministry, will for sure be guaranteed via appropriate monitoring of ventures. It good to further note that the model portrays that Forecasting accounts for 26.9% of discrepancies in procurement performance, resource apportionment accounts for 17.2%, staff

aptitude accounts for 20.1 % and lastly contract management accounts for 23.3% of variations in procurement performance, (Kiage,2013).

In Kenya, Public procurement is greatly affected by staff competencies, legal context, formal philosophy and Information Communication Technology (ICT). It is therefore prudent to always have in place, competent members of staff in the procurement sections to achieve more on matters international procurement standards, (Ngwili et. al., 2014).

2.10.1: Strategy/Strategy Formulation and Implementation

Coming up with a vision (Dream) and mission(Purpose, work, assignment), categorizing an organization's external opportunities and threats, being well versed with its internal strengths and weaknesses, finding out what are the long-term aims/goals/objectives, producing other policies/strategies, and picking particular policies to pursue. Policy implementation is often called 'action plan' of strategic management.' Good strategy design is a sign of devotion to decent corporate free enterprise, Oanda (2013).

Several encounters that can damage the successful execution of the best plans, but following the right channels, outlines and judgement can greatly work down such challenges. It is also important to consider looping in all relevant stakeholders as far as possible during this important process of strategy formulation, communicate appropriately and ensure that knowledge is well dispensed on both strategy design and execution.

2.10.2: Link Between Corporate Strategy (CS) and Procurement Strategy (PS)

A Procurement Strategy is more focused on the organization's strategic procurement objectives. It is therefore clear that the procurement strategy is wider and not only involves matters procurement but also the overall corporate strategy of an organization, therefore addressing a stream of ways in which and organization's strategy addresses the methods it deems appropriate to ensure services are delivered in a wide range of sense as it concerns other players and partners, (Wathan, 2002).

On a wider scale, an organization deals with markets and industries whereby a strong definition is more on where the organization competes within which it competes; this is the corporate strategy, (Gallagher, 2013).

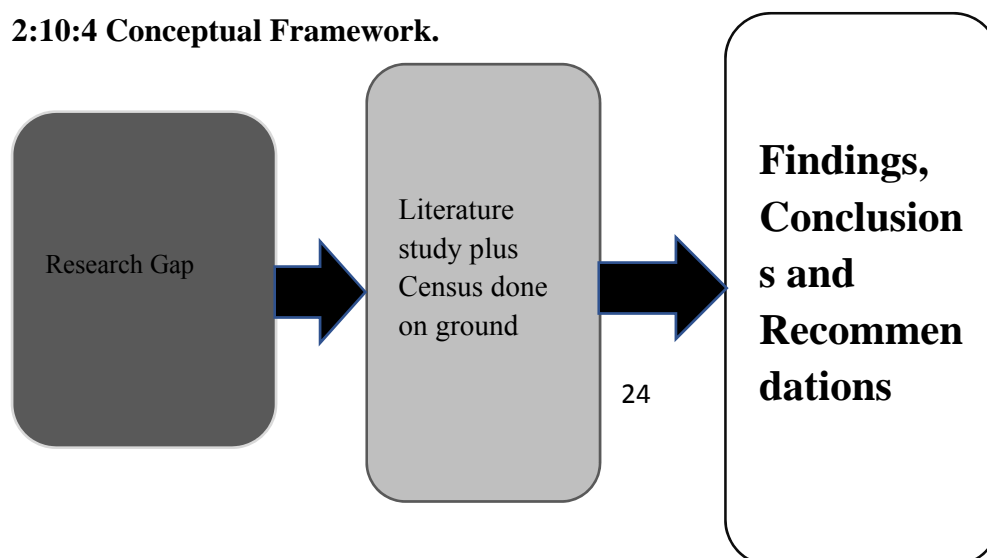
With the highly corporate set ups controlled from the center, profit focus and responsibility is also held at the center as the main focus of the business. This renders other functional units segmented in terms of management; and working towards a similar goal which is profitability. These departments may include Sales, procurement, Human Resource among others. In a centralized model of semi-autonomous business or business units are at the other end of the range. Each commercial unit has its own complete set of roles and is accountable for its performance. Procurement strategy is therefore a subset of the corporate strategy, (King, 2015).

2.10.3: Mitigation Strategies Facing Implementation of E- Procurement

Availability of the appropriate technology incorporation into the daily business activities, particularly electronic procurement, seems to be at the center dependency on whether to adopt it or not. The competency level of the members of staff in terms of IT training is also a factor affecting electronic purchasing adoption. It also requires managerial commitment on the part of the management. The centralized nature provisions as far as the legal provisions are concerned, leaves electronic purchasing methods only manned by a central committee called the tendering committee which may not have interests in spreading viable electronic practices equally to all the corporate functional units, (Makau, 2014).

Electronic mode of buying products and services, is used in relation to conditions of supply generally. These conditions are characterized by both ‘marketplaces’ and ‘pecking orders, which are pre-defined buying strategies of various firms, rather than available expertise, which regulates when marketplaces and pecking orders are used. An original model is introduced, concentrating on coming up with an e-procurement dogma which can act as a provision for strategic purchasing targets. The model generalizes findings from stages in the research and marries together fundamentals from various papers and outlines resulting in general rules for implementation of this expertise, (Alan, 2010).

2:10:4 Conceptual Framework.



2.11: Chapter Two Summary.

The chapter was entirely geared towards opening the stage for what has been researched by others. It defined the meaning of many of the technical terms setting the language and the pace in the entire study.

It showed that there is ample knowledge in general maintenance, procurement electronic procurement, Just In Time, strategy knowledge, sustainability concern for matters procurement, and most importantly, the linkages amongst all these technical terms. It lit the way for the researcher towards literature which was hitherto not very clear.

CHAPTER THREE:

3:0. RESEARCH METHODOLOGY

3:1. Introduction

People have overtime engaged in varied activities relating to trade. Knowingly or unknowingly, people have done ‘research’ in a bid to improve their ways of carrying out trade. Since the times of the simplest methods of batter trade, to mailing letters, then to faxes and speed posts and the contemporary E-mail which now comes with E-Procurement.

3:2. Research Design and Site

Research strategy is the proposal and the process of research that run through conclusions from broad expectations to comprehensive methods of data gathering and scrutiny. These conclusions must be well thought by the researcher and based on the nature of the research problem or issue and the researchers’ individual skills (Cooper and Schindler, 2006). It is in this light that a well thought research design to represent the Private Hospitals at level 4 and above in Nairobi City County which are registered with Kenya Medical Practitioners and Dentists Board (**KMPDB**), had to be arrived at.

3:3. Population of the Study

After examination of events or objects of a certain group and finding that they could be having common observable characteristics, one can refer to this as the population of study. Due to the size of a population the researcher may want to generalize the finding with a section of the population where by a target population must be formulated, (Mutava, 2012). This study focused on Private hospitals registered at level four and above under the Kenya Medical Practitioners and Dentists Board, within City County of Nairobi. The number of health providers registered under KMPDB within level four and above in the County were 64 as at 31st of August 2018.

3:4. Census

Qualitative research in old age and aging has used experimental cell sample sizes of from 10 to 100, with gathering around 50'. Others writing in this area suggest '12-20 (data sources) when looking for conflicting indication or trying to achieve extreme distinction (Tuckett, 2004).

Since the population was manageable, data was proposed to be collected from all the hospitals to give a clear picture of the situation on the ground, with hope that data collection saturation levels would be within agreeable limits.

The quality of the data and the number of interviews per partaker regulate the amount of functional data gotten. There is an converse connection between the amount of functioning data

gotten from each participant and the number of participants. The larger the amount of serviceable data gotten from each person (as number of interviews and so forth), the less the sum of participants (Morse, 2000).

From the Census conducted on the sixty-four Private hospitals within Nairobi City County, the respondents included representatives from the procurement functional department or the hospital Maintenance section representatives.

3:5. Data Collection Instruments and Procedure.

The data collection was done through questionnaires only.

3:5.1 Questionnaires

Standard questionnaires were administered personally or through emails to the selected respondents in the relevant departments in the 64 health facilities. The guided questionnaires, based on the research objectives, were structured to allow the respondents to give their views on the procurement methods which were in use for maintenance materials procurement in Nairobi City County, the most preferred method of maintenance materials procurement in the County, and identification of the challenges which faced the implementation of e-procurement of maintenance materials in Nairobi City County in the selected private hospitals.

3:6. Qualitative Data Analysis and Presentation

3:6.1 Descriptive Narrative Technique.

According to Carrie, (2007), one identifier of a qualitative research is the communal spectacle being explored from the participant's viewpoint. There are different categories of research strategies that use

qualitative research practices to structure out the research tactic. As a result, the different practices have a theatrical effect on the research strategies explored.

Qualitative data denotes to all non-numeric facts or facts that have not been quantified and can be a creation of all research strategies. It can range from a short list of responses to open-ended questions in an online questionnaire to more multifaceted data such as transcripts of in-depth interviews or the whole policy documents. To be useful these data need to be examined and the connotations unraveled. Qualitative data analysis measures support in this, this allows researchers develop theory from his data. They encompass both deductive and inductive tactics and, like the process used to construct a jigsaw, has a sort of a series from the simple categorization of responses to processes for finding relationships between groups (Sounders et. al., 2009).

Tables were used to tabulate the response rate of the targeted population. Frequencies and percentages were computed to show among others; whether E-Procurement is existing, and whether it was the preferred method of procurement of maintenance materials in Private Hospitals in Nairobi City County. These were described qualitatively based on the research objectives and hypothesis testing information.

The frequencies of the most preferred, the most available methods of procurement of maintenance materials were the basis of determining the indications within each study objective and hypothesis and were used to make qualitative inferences and descriptions.

3:6.2. Data Presentation

The presentation of data was linked directly from the field and according to research questions. The results from the analyses were reported using supporting description, field notes, tables, charts and graphs. No participant was identified by name, and no age was linked to any respondent; these were held in confidence.

3:6.2. Results on Research Proposition

This was done through identifying the number of respondents who had acknowledged any proposition of the proposition that purchasing supported by Electronic platform was the most preferred system of procurement of construction materials for Maintenance works in the Private Hospitals in City County of Nairobi in a bid to make the required extrapolation.

3:6. Chapter Three Summary

It was quite fundamental for the researcher to plan the course of action through the research. This necessitated the thought of the outline of the study in chapter three; the Research Methodology. It Captured how the research design would be and at the site, based on the population of the study. A census was the most appropriate for this study; i.e all the level four and above hospitals in the City County of Nairobi.

Data collection was majorly through questionnaires and qualitative mode of analysis was used through particularly a descriptive Narrative technique. Data was presented using tables graphs, charts and general narrative form to qualify the ground observations. This was followed by strategy of presentation of the research results.

CHAPTER FOUR:

4:0. ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS FROM DATA COLLECTED

4.1. Introduction

This is the presentation of results as per the data composed in the field. The presentation is largely guided by the previous planning of the data collection in the field. This is through addressing the findings on the Factors which Affect Implementation of Strategic Electronic mode of procurement of Construction Materials for Maintenance Works; A Study of Private Hospitals in Nairobi. The three study objectives were:

- i. To identify which planning methods are in use in procurement of Materials for Maintenance Work in Private Hospitals within the Nairobi City County.
- ii. To find out the most preferred method used in procurement of materials for Maintenance works within Private Hospitals in Nairobi City County.
- iii. To find out which challenges face the implementation of E-Procurement of materials for Maintenance works in these hospitals.

The study, involved the 64 private hospitals registered with KMPDB at level 4 and above . Questionnaires were used to collect the data whereby some were sent via email and others were

administered on a face to face basis. Analysis of the findings from the field was done and presented at the end of the chapter.

4.2: The Rate of Response

Out of the total of sixty-four Private hospitals, 39 responded to the questions posed in the questionnaire. This represented 61% of the sample size which is adequate to represent the whole population. With reference to Mutava, (2012), a response rate of 50% can be comfortably reported, 60% is usually a good response rate and 70% is excellent.

A telephone introduction was done before going for data collection though there were challenges ranging from difficulties in convincing the respondents to go out of their schedules to give data, to feelings of threat to confidentiality leading to rejection of the data collection in some instances. Nevertheless, 39 responded positively and the respondents who gave data were professionals in procurement and maintenance sections, therefore their data can be relied upon.

Table 2 - 4 Rate of Response

Item	Questionnaires Handed out	Questionnaires Responded to	Response Rate
A	64	39	61%

Source: Author, 2019

4.3: Procurement Methods for Maintenance Materials and Challenges Faced.

Table 3 - 4 Methods used in planning for Procurement of Maintenance Materials

Item	Method	Frequency	Percentage
A	As need arises	30	77%
B	Pre-determined through prior planning	9	23%
C	Still being developed.	0	0%

D	Fully computerized and signals needs for reorder.	0	0%
E	Other	0	0%
Totals		39	100%

Source: Author, 2019

Among the available options to use in planning for procurement of maintenance materials, only two methods showed response. Most of the private hospitals (77%) showed non availability for maintenance procurement planning, 23% responded positively for the procurement planning. No respondent among the 39 showed that the maintenance materials procurement system is being developed or fully computerized.

Table 4 – 4 Means of sending LPOs (Local Purchase Orders) to Suppliers

Item	Means	Frequency	Percentage
A	Email	20	51%
B	Placed in the website	0	0%
C	Placed on our Facebook Page	0	0%
D	Post	0	0%
E	Motor rider	19	49%
F	Other	0	0%
Totals		39	100%

Source; Author, 2019

Of the 39 respondents, 51% indicated that their LPOs are usually via email to their suppliers meaning that this is the most used method of informing their suppliers that their items are required for supply. 49% indicated that their LPOs are via motorbikes. It is worthwhile to note that there isn't much difference between the two. It is worthwhile to note that the old ways of sending documents through the Post have been abandoned by a huge percentage of private hospitals, may be due to the time factor. Placing documents on a supplier's website or Facebook page doesn't attract many users due to the little assurance that the documents were delivered.

Table 5 -4 Reasons for using a Certain Method for LPO delivery to Suppliers.

Item	Reason	Motorbike Frequency	Email Frequency	%- Motorbike	%- Email
A	Very fast	8	3	30%	8%
B	User friendly	5	7	19%	19%
C	Cost effective	11	8	41%	22%
D	Readily available	3	4	11%	11%
E	Keeps records	0	15	0%	41%
F	Secure	0	0	0%	0%
G	Other	0	0	0%	0%
		27	37	100%	100%

Source: Author, 2019

There is a sense of cost and time management noting that those who preferred the motorbike method of delivery considered cost effectiveness and time efficiency. These took the lead with 41% and 30% among the 27 respondents who use motorbikes. Documents via motorbike reach their destinations faster than those by post, for instance.

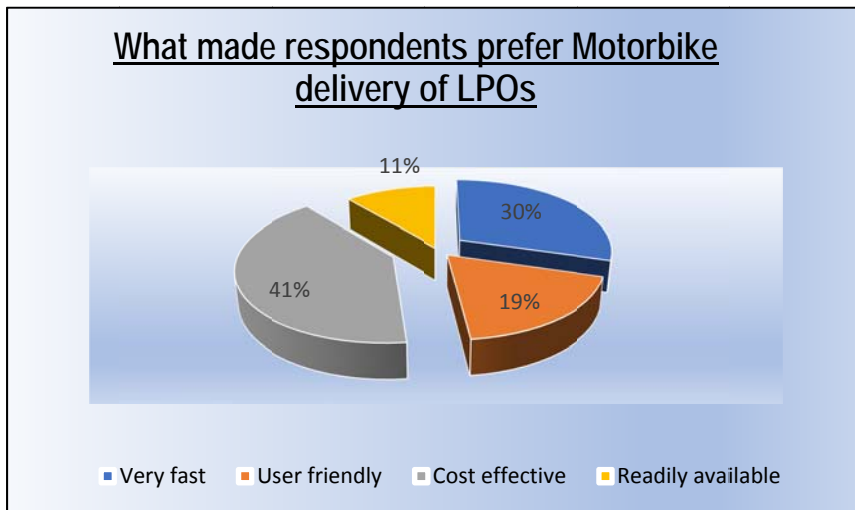
The response also shows that motorbike riders are readily available and are user friendly due to the response rate of 19% and 11% respectively, but these are not the major concerns, but moderate factors considered by most private hospitals procurement departments using motorbike riders.

The security and record keeping factors seem to worry the hospital procurement officers less since they trust whoever they send information via motorbikes. Some of the riders are employees

of the hospitals. Therefore, neither security nor record keeping concern is raised, since they send only copies of original LPOs.

The four major factors considered by those who chose motorbikes as the means of LPOs delivery are also represented in figure 2 - 4 below:

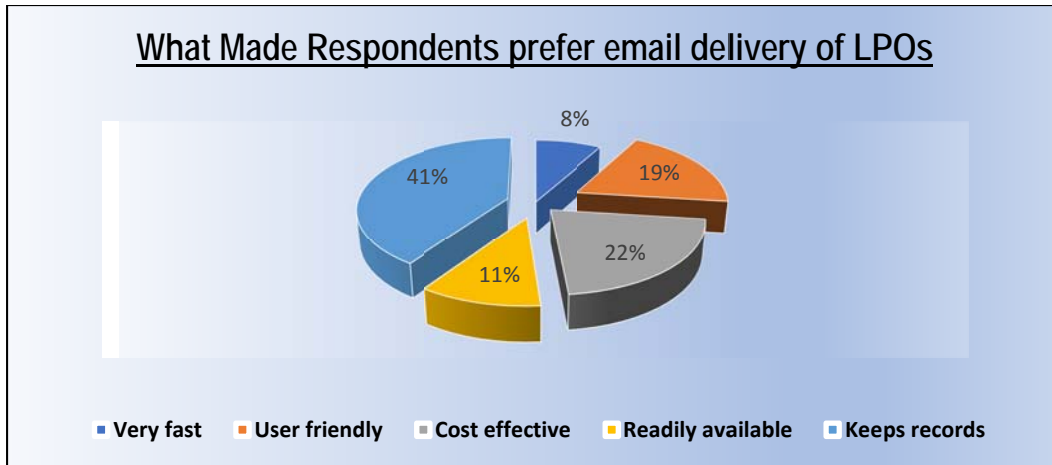
Figure 2- 4 What made respondents prefer motorbike for LPOs Delivery



Source: Author, 2019

Those who preferred to use email as the method of delivery were driven by record keeping (41%), cost effectiveness (22%) and being user friendly. The respondents did not perceive the email to be secure, possibly because of cases of increased cybercrime. This is represented by figure 3 - 4 below:

Figure 3 – 4 What made respondents prefer Email for LPOs Delivery



Source: Author, 2019

Table 6 - 4 Challenges on methods of procurement

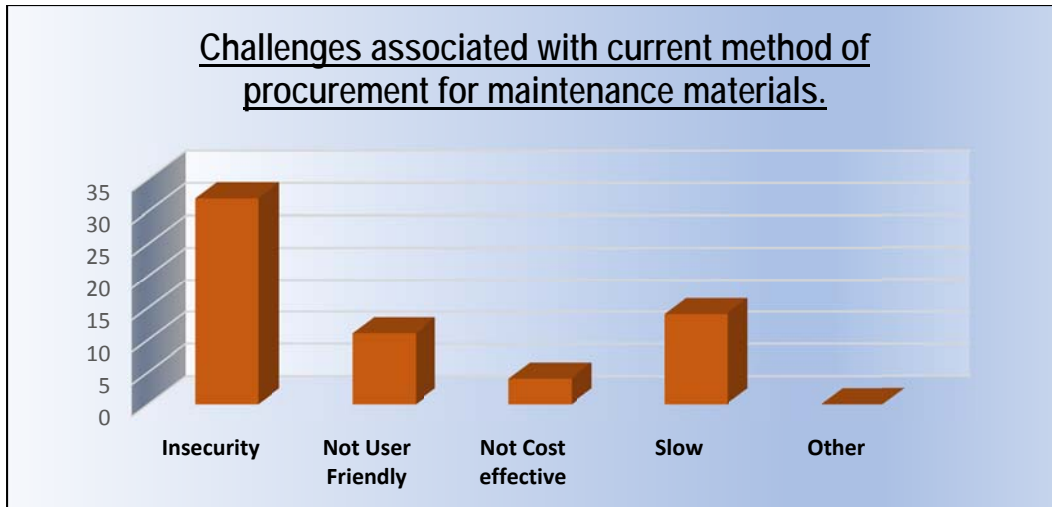
Item	Challenge	Frequency	Percentage
A	Insecurity	32	52%
B	Not User Friendly	11	18%
C	Not Cost effective	4	7%
D	Slow	14	23%
E	Other	0	0%
		61	100%

Source:
Author,
2019

The
two

major methods used for maintenance materials procurement as earlier analyzed were that the procurement is based on need basis (77%) and very little percentage (23%) plans for pre-procurement of the maintenance materials. This leads to the sense of insecurity (52%). This is also shown in figure 4-4 below:

Figure 4 - 4 Challenges on methods of procurement of maintenance materials



Source: Author, 2019.

Various respondents proposed the following changes to procurement management for maintenance materials procurement:

1. Coming up with one holistic system to serve the hospitals together with their suppliers.
2. Increase the personnel in charge of this line of procurement.
3. Create awareness on other methods of procurement.
4. Systematic procurement; Having specialized systems.
5. More paperless and internet-based procurement.
6. Coming up with a faster method of procurement.

4:4 Procurement Policies, Procedures, Benefits and Challenges

Table 7 - 4 The status of E-Procurement on the sampled Hospitals

Item	Status	Frequency	Percentage
A	There is no E-Procurement Practiced	24	32%

B	There is no reliable Internet connections	0	0%
C	Hospital does not need E-Procurement	5	7%
D	The Hospital needs E-procurement	12	16%
E	Challenges implementing E-Procurement	0	0%
F	There are benefits in E-Procurement	8	11%
G	No existing e-procurement policies	15	20%
H	the Suppliers require E-Procurement	2	3%
I	the Suppliers require Manual System	9	12%
		75	100%

Source: Author, 2019

Most respondents indicated that the status of not practicing E-procurement in private hospitals sampled was very high at 32%. Also, there were no existing E-procurement policies. On the flip side no respondent showed that there were any apparent challenges in implementation of E-procurement in private hospitals. Very few respondents 3% indicated that their suppliers require E-Procurement. It is worthwhile to note that most private hospitals have no E-Procurement policies as shown by 20% of respondents to that effect.

Table 8 - 4 Reasons impeding practice of E-Procurement in most Private Hospitals

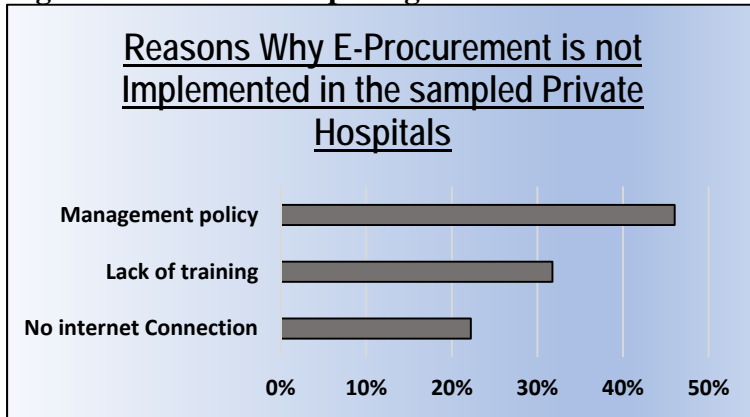
Item	Reason	Frequency	Percentage
A	No internet Connection	14	22%
B	Lack of training	20	32%
C	Management policy	29	46%
D	No benefits	0	0%
E	It is not secure	0	0%
F	Other reasons	0	0%
		63	100%

Source: Author, 2019

The respondents were picking all the reasons why the hospitals they work for do not practice E-Procurement. A respondent could pick more than one reason, hence a total of 63 responses. Most respondents (46%) indicated that management policy was majorly the reason for not practicing

E-Procurement. Lack of training was also a reason, at 32%. No respondents indicated that E-Procurement was not used because of insecurity or lack of benefits.

Figure 5 - 4 Reasons impeding E-Procurement Practice in Private hospitals.



Source: Author, 2019.

Table 9 - 4 Suggested benefits to be Accrued from E-Procurement Practice.

Item	Benefit	Frequency	Percentage
A	Speed	30	38%
B	Secure	23	29%
C	Cost effective	20	25%
D	Availability	7	9%
E	Other	0	0%
		80	100%

Source: Author, 2019.

Most respondents (38%) indicated that if E-Procurement is practiced, speed of execution of procurement assignments would be the most benefit. Others indicated security (29%), and cost effectiveness (25%) as other benefits.

Table 10 - 4 Most preferred method of Procurement

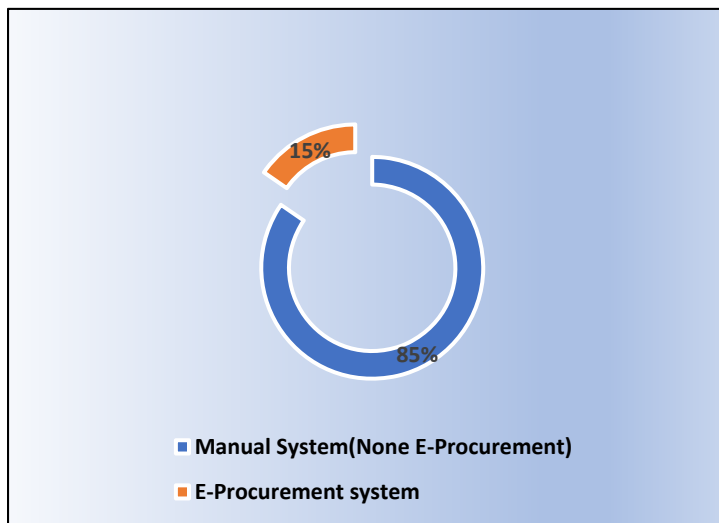
Item	Method	Frequency	Percentage
A	Manual System (None E-Procurement)	33	85%
B	E-Procurement system	6	15%

C	Hybrid System	0	0%
D	Other	0	0%
		39	100%

Source: Author, 2019

Most hospitals (85%) sampled showed that they prefer the manual system of dealing with procurement for maintenance materials. The rest (15%) practiced E-Procurement system. No respondents indicated that they prefer a Hybrid system of dealing with procurement for maintenance materials. It therefore means that most private hospitals procurement for maintenance materials is done through the manual system.

Figure 6 – 4 Most preferred method of Procurement



Source: Author, 2019.

The following are the **benefits** the respondents said that they get while using the **manual/traditional method** of procurement:

- a) Easy to use since the suppliers use manual system

- b) Easy accountability
- c) No serious training is required.
- d) Manual system is in line with hospital polies
- e) Readily available and no installations or computer packages are required.
- f) Cost effective

Among the **challenges** faced while using the **manual/traditional method** of procurement, the respondents highlighted the following:

- a) Delayed supplies
- b) A narrow range of products
- c) Slow
- d) Costly

Various respondents mentioned the following **benefits** that they get while using the **E-procurement method**:

- a) Fast
- b) Keeps records
- c) Easy to audit
- d) Cost effective

The **challenges** highlighted for using **E-Procurement** were:

- a) Training requirements
- b) Initial installation costs
- c) Lack of awareness

The following were suggested **benefits** that could be harnessed if a **hybrid method** of procurement which involves integration of both the manual and e-procurement methods is used:

- a) It would enable deal with many suppliers
- b) It has a wide range/scope of applications
- c) Easy to audit manual documents
- d) In case of internet slow down the manual system can support the procurement.
- e) It is easy to integrate it in an organization
- f) It is secure
- g) It is cost effective

On areas of improvement that would make the procurement of Maintenance materials **generally** in the private hospitals, the respondents highlighted the following:

- a) Use of new systems and methods
- b) Internet connectivity
- c) E-Procurement awareness
- d) Provision of e-procurement systems/Applications
- e) Pre-planned procurement should be enhanced
- f) Training on E-Procurement
- g) Always stock materials for maintenance

Most of the respondents indicated that it is true that E-procurement **saves organizations money**, with the following reasons.

- a) Avoids the rider and Post office charges
- b) Easy to correct errors online without wasting papers printing

- c) Reduces Manpower required to handle certain procurement duties
- d) Its sense of efficiency saves organizations money
- e) Being secure it saves organizations money
- f) Less costs of record keeping and storage space for records

4:5 Chapter Four Summary

From the various private hospitals surveyed, there are many factors affecting the implementation of the strategic E-Procurement of construction materials for maintenance works. These factors include; there being no prior planning for the procurement of these materials (77%), a high percentage of private hospitals using manual systems (85%), lack of training in E-procurement, and lack of use and awareness of the benefits of e-procurement which is clear from the fact that majority of the suppliers do not use E-Procurement applications.

CHAPTER FIVE:

5:0. DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The purpose of this study was to survey the Factors affecting the Implementation of strategic E-Procurement of Construction Materials for Maintenance works; with a case study of private hospitals in Nairobi City County.

The study objectives were, first to identify the procurement methods in use in procurement of construction Materials for Maintenance Work, second objective was to find out the most preferred method of procurement of construction materials for Maintenance works, and finally to find out the challenges that faced the implementation of strategic E-Procurement of construction materials for Maintenance works in selected private hospitals in Nairobi City County. All these had corresponding research questions documented to aid the research.

Information was collected from the private hospitals in Nairobi City County that were sampled, based on those with structures that would have a maintenance component depending on their level of registration in the Kenya Medical Practitioners and Dentistry Board (KMPDB). The study sample comprised of 64 hospitals which were at the classification of level four and above as at 31st of August 2018.

The analysis, interpretation and presentation of the findings of the study gives the researcher the ability to do discussions, conclusions and recommendations of the findings now in this chapter.

5.2 Study Findings Discussion

From the study, it is clear that there are challenges in the implementation of strategic E-Procurement of construction materials for maintenance works in private hospitals in Nairobi City County.

Going by the study objectives, first, there are procurement methods in use in the private hospitals. Procurement of the construction materials on “as and when needed” basis is one of the methods in use, while some private hospitals use planning as a tool to make future decisions on procurement needs of these construction materials for maintenance works.

In the real sense the range of methods of procurement, based on the timelines required and the solutions the construction materials are supposed to solve, is not wide and the findings show that it zeroes on planning or lack of planning. This is supported by the nature of maintenance; corrective and planned maintenance, where by a balance of the two, based on the ideal cases is of great importance.

The second objective was to find out the most preferred method of procurement of materials for Maintenance works, and the findings are that the most preferred method of procurement of construction materials for maintenance works was the manual system, and only a few preferred the E-procurement system. E-procurement system of procurement of construction materials for maintenance work is not embraced in majority of the private hospitals in Nairobi City County. Therefore, there is an indication that possibly the hospitals address maintenance issues based on

the policies already set by their institutions, whereby E-Procurement is not a very well embraced method.

The third objective was to find out the challenges that are faced by the implementation of Strategic E-Procurement of construction materials for maintenance works in private hospitals in Nairobi City County. The findings show that Training requirements, Initial installation costs, and lack of awareness. These are the major challenges that if addressed, e-procurement would pick in most hospitals in Nairobi City County.

The fact that most respondents indicated that E-procurement was not at all practiced in their hospitals means that the use of technology in procurement for maintenance is still low in most private hospitals in Nairobi City County. This derails the implementation of strategic E-procurement of construction materials for maintenance works. However, all is not lost as most respondents indicated that given an opportunity to propose changes to procurement management, especially in the procurement of construction materials for maintenance, they would propose use of new systems, promotion of E-procurement awareness among the staff members and their suppliers, internet connectivity to be enhanced also to their suppliers, enhanced pre-planned procurement and training of members of staff and their suppliers on E-procurement.

5.3 Research proposition Discussion.

Due to the need for understanding the factors affecting the implementation of strategic E-procurement of construction materials for maintenance works, the study had the following research proposition:

- E-Procurement is the most preferred method of procurement of construction materials for maintenance works in private hospitals in Nairobi City County.

The findings were clear about the level of E-procurement implementation for procurement of construction materials for maintenance works, in that the largest percentage; 72% indicated that the status was “Not at all Implemented” meaning that E-Procurement was not the most preferred method of procurement. Therefore, the proposition was not correct.

The findings on the proposition statement which describe the status of E-procurement in private hospitals; 32% indicated that, there was no E-procurement practiced in the hospitals. It is therefore clear that this proposition can be rejected based on these findings.

5.4 Conclusions

The implementation of strategic E-procurement of construction materials for maintenance works is of great importance if hospitals are to operate more efficiently particularly on the maintenance works. There are a list of factors affecting this effort in private hospitals in Nairobi City County such as not planning for maintenance and doing it as all corrective and on need basis, extensive use of manual system instead of E-procurement which slows down processes and reduces room for new knowledge exploration, and suppliers’ mode of operation driving the hospitals into using the manual systems for convenience.

These factors are driven by challenges such as management policies which stick on traditional procurement methods, lack of awareness about E-Procurement by the suppliers to the hospitals,

internet connectivity challenges especially within the suppliers' operational areas, and lack of training in the private hospitals and amongst the suppliers.

The study proposes that the awareness of the private hospitals about the need to classify maintenance in terms of planned, preventive and corrective maintenance are of high importance. There is need for the hospitals to embrace new technology if they want to handle hospital maintenance work strategically.

5.5 Recommendations

Since there are several challenges which account for the slowdown in the take up of the strategic implementation of E-procurement, these factors need to be addressed. The challenges can be addressed as follows:

Management policies need to be reviewed from time to time. There should be strategic review of the existing policies in handling of procurement of construction materials for maintenance works.

Create E-Procurement awareness within the hospitals and amongst the suppliers. It will be a good idea to hold meetings with suppliers and discuss how well this can be done since most suppliers have the monotony of stocking and supplying certain products, it may be an effort to impose changes on how they should handle their supplies business.

5.6 Research gaps for Further study.

The following areas have been identified for further research since this study would not exhaust everything.

1. Levels of awareness of maintenance programming among facilities managers in Private Hospitals in Nairobi City County.
2. Research on available computer-based maintenance systems in use for maintenance in institutions.
3. Level of Maintenance Programming Training in Private Hospitals in Kenya in Kenya.
4. Level of internet connectivity among construction materials suppliers and its relationship with the type of methods adopted for procurement of materials from these suppliers in Nairobi.

5.7 Chapter Five Summary

Coming to the end of the research, the findings were detailed. This was based on the findings I a manner to synthesize what the analysis of the data depicted. The proposition on Electronic procurement being the most preferred method of procurement was to the contrary of the proposition.

The researcher gave conclusions to sum up the study as far as the research topic was concerned. The implementation of Strategic electronic Procurement of construction was found to be very fundamental on maintenance within the research site.

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APPENDICES

APPENDIX (1) QUESTIONNAIRE

Letter of introduction to the Selected Private Hospitals in Nairobi City County.

Dear Sir/Madam,

I am a student in the University of Nairobi undertaking a Master of Arts Degree in Construction Management. It is a requirement for a student undertaking this course, to carry out a research and document the findings in a research project report. I am carrying out research on:

“Factors Affecting Implementation of Strategic E-procurement of Construction Materials for Maintenance Works; A Study of Private Hospitals in Nairobi”.

I have sampled your institution as a source of data for the study. I would be grateful if you could complete the attached questionnaire. I appreciate your assistance in facilitating this research. Any information provided will be treated with strict confidence and will be used for the purpose of this academic study only. No individuals will be identified in the report nor will any other subsequent dissemination of the information happen.

Thank you for your time and co-operation.

Yours Faithfully,

Joel Muli Mumo (B50/69234/2011, Cell Phone Number 0721 – 607 836)

The series of questions in this questionnaire are designed to obtain organizational response on existing procurement policies, procurement procedures, sustainability of the existing procurement methods, procurement strategies in place currently, challenges on current maintenance procurement methods, opinions on comparison of other available methods of maintenance procurement, current future preferences in maintenance procurement, awareness of E-procurement, future policy requirements on maintenance procurement, anticipated future challenges in maintenance procurement and Lessons learned in selected Private hospitals set up in Nairobi City County.

To Procurement Managers/Officers in Private Hospitals in Nairobi.

Name of the Private Hospital.....

1. Procurement methods for Maintenance Materials, and Challenges.

A. Which of the following is the method used in planning for procurement of materials for Maintenance works in the hospital you work for? (**Tick all that are appropriate**).

- As need arises
- Pre-determined through prior planning
- Still being developed.
- Fully computerized and signals needs for reorder.
- Other
Specify.....

B. Local Purchase Orders are usually sent via (tick only one).

- Email
- Placed in the website
- Placed on our Facebook Page
- Post
- Motor rider

- Other , Specify.....

C. What has made you prefer using the method (s) specified in “B” above, over the past time? (Tick **all** that are appropriate).

- Very fast
- User friendly
- Cost effective
- Readily available
- Keeps records
- Secure
- Other , Specify.....

D. The challenges associated with the current method of procurement are: (tick **all** that are appropriate)

- Insecurity
- Not User Friendly
- Not Cost effective
- Slow
- Other , Specify.....

E. Given an opportunity to propose changes to procurement management, which changes would you propose?

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2. E-Procurement Policies, Procedures, Benefits and Challenges.

A. Which of the following statements describe the status of e-procurement in the Private Hospital you work for (Tick **all that are Appropriate**).

- There is no E-Procurement Practiced
- There is no reliable Internet connections
- hospital does not need E-Procurement
- The Hospital needs E-procurement
- Challenges implementing E-Procurement
- There are benefits in E-Procurement
- No existing e-procurement policies
- the Suppliers require E-Procurement

- the Suppliers require Manual System
- B.** The institution’s E- Procurement level of implementation for maintenance materials procurement is rated at:

- Not at all implemented
- At planning stage
- Just Started Implementation
- At Advanced stages.

C. If there is **NO** E-Procurement practiced in your institution for maintenance materials procurement, what are the **reasons (Tick all that are appropriate)**?

- No internet Connection
- Lack of training
- Management policy
- No benefits
- It is not secure
- Other reasons ,

Specify.....

D. Regardless of the methods used for Procurement of Maintenance Materials in the Private Hospital you work for, what **benefits** do you think can be obtained from internet-based procurement (E-Procurement), whether through, cell phones or Computers?

- Speed
- Secure
- Cost effective
- Availability
- Other

Specify.....

E. Rate the most preferred method of procurement by your **suppliers**:

- Manual System (None E-Procurement)
- E-Procurement system
- Hybrid System
- Other , Specify.....

F. If your answer is **Manual System** in “**E**” above, list the **benefits** you get from this system of Procurement.

.....

G. If your answer is **Manual System** in “**E**” above, list the **Challenges** you get from this system of Procurement.

.....
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H. If your answer is **E-Procurement** in “**E**” above, kindly list the **benefits** you get from this system of Procurement.

.....
.....
.....

I. If your answer is **E-Procurement** in “**E**” above, kindly list the **Challenges** you get from this system of Procurement.

.....
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.....

J. Regardless of the methods used for Procurement of Maintenance Materials in the Private Hospital you work for, what **benefits** do you think can be obtained from **Hybrid Based Procurement** (E-Procurement & Manual)?

.....
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.....

K. In your opinion, what are the areas of **improvement** you would recommend such that Procurement of Maintenance Materials for the Private Hospitals can be made better?

.....
.....
.....
.....

L. In your Opinion, does E-Procurement save the hospital money and in how many ways?

APPENDIX (2) LETTER FROM RECM, UNIVERSITY OF NAIROBI



UNIVERSITY OF NAIROBI
DEPARTMENT OF REAL ESTATE AND CONSTRUCTION MANAGEMENT
P.O. Box 30197, 00100 Nairobi, KENYA, **Tel: No. +254-020-491 3531**
E-mail: dept-recm@uonbi.ac.ke

Ref: B50/69234/2011

Date: 29th June, 2018

To Whom it May Concern

Dear Sir/Madam,

RE: MUMO JOEL MULI – B50/69234/2011

This is to confirm that the above named is a second year student in the Department of Real Estate & Construction Management pursuing a course leading to the degree of M.A. Construction Management.

He is carrying out a research entitled "***Factors Affecting Implementation of Strategic E-Procurement of Construction Materials for Maintenance Works; A case study of Private Hospitals in Nairobi***" in partial fulfillment of the requirements for the degree programme.

The purpose of this letter is to request you to allow him access to any kind of material he may require to complete his research. The information will be used for research purposes only.

Isabella N. Wachira -Towey (PhD),
Chair & Senior Lecturer
Department of Real Estate & Construction Management

APPENDIX (3) RESEARCH PERMIT AND UTHORIZATION

**THIS IS TO CERTIFY THAT:
MR. JOEL MULI MUMD
of UNIVERSITY OF NAIROBI, 0-100
Nairobi, has been permitted to conduct
research in Nairobi County**

**on the topic: FACTORS AFFECTING
IMPLEMENTATION OF STRATEGIC
E-PROCUREMENT OF CONSTRUCTION
MATERIALS IN MAINTENANCE WORKS; A
STUDY OF PRIVATE HOSPITALS IN
NAIROBI.**

**for the period ending:
8th August,2019**


.....
**Applicant's
Signature**

**Permit No : NACOSTI/P/18/33918/23889
Date Of Issue : 8th August,2018
Fee Received :Ksh 1000**




.....
**Director General
National Commission for Science,
Technology & Innovation**

CONDITIONS

- 1. The License is valid for the proposed research, research site specified period.**
- 2. Both the Licence and any rights thereunder are non-transferable.**
- 3. Upon request of the Commission, the Licensee shall submit a progress report.**
- 4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.**
- 5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.**
- 6. This Licence does not give authority to transfer research materials.**
- 7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.**
- 8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.**



REPUBLIC OF KENYA



**National Commission for Science,
Technology and Innovation**

**RESEARCH CLEARANCE
PERMIT**

Serial No.A 19981

CONDITIONS: see back page



**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

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When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/18/33918/23889**

Date: **8th August, 2018**

Joel Muli Mumo
University of Nairobi
P.O Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Factors affecting implementation of strategic e-procurement of construction materials in maintenance works; A study of private hospitals in Nairobi,”* I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **8th August, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.

National Commission for Science, Technology and Innovation is ISO9001:2008 Certified