

E-PROCUREMENT ADOPTION AND PROCUREMENT ROCESS IN RWANDA: A CASE OF MUHIMA, SHYIRA, REMERA- RUKOMA

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Abstract: This paper assessed the e-procurement adoption and procurement process, a case of District hospitals in Rwanda . This was guided by three specific objectives: to establish the extent of ICT applications on the District's hospitals procurement processes; to determine the challenges of e-procurement adoption on the procurement processes in District hospitals in Rwanda; to determine relationship between the individual factors and Procurement process in District hospitals in Rwanda. The target population of the study was comprised of 54 employees of District hospitals in Rwanda. The study used a purposive sampling technique. With purposive sampling technique as a type of non-probability sampling, the researcher uses his /her own judgment about which respondents to choose, and picks only those who meet the purpose of the study. Through structured questionnaires, the researcher was able to collect primary data. Secondary data were collected from relevant literature review, business magazines, journals, internet and other relevant materials. The study revealed that for 87.5% respondents, no relation were between procurement officers and Government suppliers. The study also revealed that 75% of respondents agreed to have received products of good quality at lower costs. The study found that majority of the respondents acknowledged that ICT applications like e -procurement in use in the District Hospitals had influenced the procurement processes. In regards to finding out the relationship between individual factors and procurement process the study finds that the relationship between the individual factors and Procurement process in District hospitals in Rwanda it was revealed that there is a positive relationship between human resource comptency in e-procurement and performance of contractors since $r = .220$, with p-value of 0.001 which is less than 0.01 as the significance level. The major challenge found in the study was that of High introduction costs for new solutions such as access to bandwidth and enterprise resource management systems that are key to implementing e-business. Organizations willing to implement e-procurement should therefore invest into structures and processes necessary for e-procurement implementation. Finally, the research found that for ICT to be easily implemented, information systems have to be set up by all players in the procurement procedures, structures will have to be invested on and processes standardized. system in their procurement processes.

Keywords: E-Procurement:, ICT applications, Procurement/ Procuring Procurement process.

1. GENERAL INTRODUCTION

Background of the study

As the ICT is developed elsewhere in the world, the information and communication technology became the best driver of the development and can be used as pillar of the development of the procurement profession. Since the development of the internet as a new communication medium, it has become a part of the strategy of public and private institutions. Many organizations have adopted the use of information and communication technology (ICT) in order to improve the products and services they offer to their customers.

Following the definition of Owuor (2004) Information and Communication Technology (ICT) is the technology which supports activities relating to the design, storage, and transmission of data and voice, jointly with their interrelated methods. As has been noted, ICT is concerned with the automation of activities, computation and telecommunications. Lucas (1987) defines an information system as a set of structured procedures which, when effected, gives information for decision making. Following the researches of Olson and Gordon (1998), information systems assist in operations analysis & management and it helps in taking strategic decisions. As highlighted in the aforementioned definitions, ICT facilitates the processing and flow of information that aims to give service to customers. Following the findings of Kitur (2006), banks, insurance companies and service companies went for ICT as it is a key success factor (KSF) that changed the decisions in both production and delivery of goods/services. According to Harelimana (2018), the result of this growth is the use of e-commerce in the business-to-business sector, new technologies and applications based on the supply chain have increasingly been adopted by organizations worldwide.

Electronic procurement (so called supplier exchange) deals with networking systems among others Electronic Data Interchange and Enterprise Resource Planning.

Importantly it is concerned with the business to government (B2G) purchase and sale of goods, works and services by the use of internet.

In other words, the e-procurement is a major component of modern Business to Business, e-commerce and can be applied to a broad spectrum of industries and markets. The signification of e-procurement varies across the literature in the world and e-procurement is defined as the use of information technologies to facilitate Business to business (B2B) purchase transaction for materials and services (Wu et al, 2007).

Asumba (2010) pointed out that E-procurement practices is related to the use of computer-internet based system to conduct the procurement process, among others search, sourcing, negotiation, ordering, receipt, and post-purchase review, therefore eprocurement system have been developed all over the world for both private and public sector organizations.

In Rwanda, healthcare is provided by public and private healthcare facilities, for public healthcare facilities, they are divided according to those at central government and those to local government and this under the latter that district hospitals rise. In as much as Rwanda is a developing country, district hospitals remain the main healthcare facilities in remote areas and every year they have public expenditure that are consumed for the seek of the service delivery to the population, therefore they need organized and strong public finance management tools as other public procuring entities.

Following this contribution in government paying out, with the deployment of eprocurement system, there is an increase in compliance with laws & regulations governing public procurement, therefore having an eye on public spending; this shows that every thing bringing slight improvements in the functioning of the public procurement system can save for the government be it in time or cost.

Statement of the problem

The Government of Rwanda decided to establish an electronic public procurement system (Rwanda online e-Procurement System). All public procurement transactions are conducted electronically. These include registration of government suppliers, preparation and publication of procurement plans, submission and opening of bids, selections and notification of winners, signing of contracts, submission of goods delivery notes and transmission of goods inspection and acceptance report, to mention a few.

The procurement system in District hospitals used to be paper oriented and its scope covers four categories of supplies or goods, works and consultant services and other services.

As highlighted by different scholars, there are some challenges in the implementation of e-procurement. In the public procurement processes, challenges can arise at the entity level. Even if they can be addressed by implementing effectively eprocurement but the latter can be itself a challenge.

During this period of Covid 19 pandemic, some payments for invoices of services delivered delayed, the district hospitals are not delivering services they used to deliver as a result of timelessness in procurement of supply or maintenance of existing medical assets, therefore impacting the whole procurement process in District hospitals.

Therefore, some of the aforementioned weaknesses in the implementation of e-procurement need more attention and these study sought to address them.

Specific Objectives

In order to achieve my purpose, the following objectives were targeted:

- i. To establish the extent of ICT applications on the District's hospitals procurement processes;
- ii. To determine relationship between the individual factors and Procurement process in District hospitals in Rwanda
- iii. To determine the challenges of e-procurement adoption on the procurement processes in District hospitals in Rwanda;

2. LITERATURE REVIEW

Theoretical review

In order to explain, predict and understand phenomena, theories are used, this allow the researcher to challenge and dig the existing literature. For this reason, a theoretical framework is made of concepts of the study & their respective definitions and possible relevant theories from other scholars (Sekaran, 2005).

Theory of Planned Behavior (TPB)

The theory of planned behavior (Ajzen, 2011) is an extension of the theory of reasoned action (TRA). Ajzen and Fishbein (1998), made necessary by the latter model's inability to deal with behaviors over which individuals have incomplete volitional control. At the heart of TPB is the individual's intention to perform a given behavior (e.g. use of ICT in procurement). For TPB, attitude toward the target behavior and subjective norms about engaging in the behavior are thought to influence intention, and TPB includes perceived behavioral control over engaging in the behavior as a factor influencing intention. A big number of information systems literature used the TPB (Mathieson, 1991; Taylor and Todd, 1995a, b; Harrison et al., 1997). The TPB is constructed on three elements that are attitude, the subjective norms and the perceived behavioral controls towards the behaviour to adopt a new technology. For attitude if you think it will have a positive effect you perform that behaviour but when you think it will have a negative effect you do not perform it. The attitude can be simulated to what do I think? The subjective norms are related to what people in your environment think about the behaviour you plan to adopt and it can be simulated to what do others think about the behaviour I am going to adopt?

Technology Diffusion Theory

Technology diffusion theory is the common lens through which theorists study the adoption and development of new ideas. The way by which a new technology/innovation is bought and embraced the acceptance of its users can explain the diffusion. The model of diffusion explains complex elements to understand the adoption of new technology by a group of persons.

According to Rogers (1995), the diffusion can be explained by the aid of 4 components as developed;

Innovation: It is about an idea, practices or object perceived as new by individuals or group of adopters. **Communication channels:** means by innovation moves from one individual to the next or group to group. **Time:** the non-spatial interval through which Diffusion event takes place. **The events include:** innovation diffusion process, relative span of time for the individual or group to adopt the innovation and **social system:** a set of interrelated units that are engaged in joint problem solving activities to accomplish the goals.

Resource Based Theory

This theory aspires to explain the internal sources of a firm's sustained competitive advantage (Kraaijenbrink, Spender, & Groen, 2010). It was Penrose who established the foundations of the resource-based view as a theory (Roos & Roos, 1997). Penrose first provides a logical explanation to the growth rate of the firm by clarifying the causal relationships among firm resources, production capability and performance. The focus was mainly on efficient and innovative use of resources. It was identified that bundles of productive resources controlled by firms could vary significantly by firm, that

firms in this sense are fundamentally heterogeneous even if they are in the same industry (Barney & Clark, 2007). Sandholm (2006) took on a resource perspective to analyze the role of procurement in new products development and ultimately organizational performance and believed that “resources and products are two sides of the same coin” and firms diversify based on available resources and continue to accumulate through acquisition behaviors.

3. EMPIRICAL REVIEW

Effect of ICT Applications on procurement process

The procurement process has had many loopholes in the recent past due to the long and tiresome processes and lots of paperwork. The chipping of ICT application in the procurement process has reduced this through the adoption of online methods of carrying out the procurement process. The use of online forms, emails, new software technologies in evaluating and making price comparisons has made this process efficient and at the same time will ensure transparency and accountability as well as reduction in errors and omissions (Caldwell, Roehrich and Davies, 2009). The adoption of these ICT applications has an overall impact on the organization in that it will reduce costs within the procurement department as well as reduce errors in the procurement process thus ensuring maximum output of the organization at the lowest costs possible. Using electronic system in procurement process enhance the transparency in the procurement transaction through direct public disclosure at all stages of procurement as the public has free access on information on bidding program, standardized documentation and lodgment of bids, progress of bid evaluation, and announcements of outcomes. Overall, the strengthening of transparency and accountability resulting from implementation of e-GP greatly reduces the opportunity for fraud and corruption in public procurement.

Monitoring and reporting tools provide access to the past and current information related to tendering process, promote an open and competitive procurement environment to the suppliers and establish level of trust which encourage more participation of potential bidders in the tenders. As the system is Built-in controls, restrict the users to strict compliance with procurement policy and legislation governing the procurement activity. Only bids submitted on specified due date and time specified in the tender document are accepted and opened, and government officers can only accord approval for a procurement activity if they are assigned the necessary rights; every activity performed in the system can be traced to a particular system user, this makes the users accountable for their actions. Auditing capability for procurement transactions, supplier selection is therefore clear and ensured (Orwenjo, M.A. and aila, F.O. 2018).

Effect of individual user Factors on procurement process

Following the results findings from Markus (1990), resistance to change would naturally being expressed by individual end users and business units.

To ensure that all individuals within the organization are well versed with the newly introduced ICT applications in the procurement process, management of the organization should emphasize on employee training and induction to ensure that they (employees) are well equipped with the necessary required skills to handle the new system with accuracy (Amaratunga & Baldry, 2002).

According to Lewis and Roehrich (2009), in their reseach concluded that among the elements to be considered by the human resource department during the recruitment process, there should be the ability and experience of potential candidates to adopt and adapt quickly new proposed technologies.

Therefore, competency should be emphasized by the organization when outsourcing for new employees for the new system.

At the same time, the management should also ensure that employees have a positive attitude towards the new system by emphasizing on its importance to the organization compared to the other systems previously in use.

Effects of challenges of ICT implementation on procurement process

These factors take into consideration companies' external environment. Supply chain complexity refers to the number of entities interacting with a particular company. In addition it takes into account the number of suppliers, their proximity as

well as the complexity of transactions. According to Markus (1990), he stated that when you have an important figure of users, it can explain the ICT applications users basing on the quantity and the importance of your supply chain partners. The collaboration level is also an element not to be neglected, long term relationships among firms which are characterized by trust have proved to make smoother the electronic integration (Konsynski and McFarlan, 1990).

Trust is a crucial barrier towards the uptake of ICT applications that needs further attention specifically in the case of developing countries which is characterized by cross-country transactions and exchanges. The nature of relationships includes characteristics such as power and dependence. Many researchers have shown that pressure from a company's environment (e.g. Suppliers-Customers) affects ICT adoption (Premkumar and Roberts, 1999; Mehrtens et al., 2001).

For Connolly and Olson, (2000), ICT is the one of the largest drivers of change in any industry. As much as ebusiness technologies have great potential to influence the direction of the productivity in an organization, the willingness to adopt is determined by a number of factors among them, reduction of transaction Costs, improvement of customer service quality, defensive reaction to competitor's adoption, requirement by customers that their suppliers link their system as a condition for doing business, Thong (1999).

On the other hand, the propensity to adopt e-procurement may be hindered by cost of investing in compatible systems, training of personnel, unwillingness to have a more open approach to tendering, perceived barriers to e-procurement among others, (Davilla et al., 2003). Uptake by suppliers will be determined by the suppliers' appetite for change.

The introduction of this new ICT system will have a major impact in the previous procurement process of the organization. Among these are obstacles in the newly adopted process. Most suppliers used to the older system will have difficulties in adapting to the new system because of lack of the necessary skills and training to handle the new system.

This means that most suppliers will be kept out of business due to lack of the necessary pre – requisites to use the new system as well as the cost involving the acquiring of the system and training costs as well.

The level of collaboration is also another factor for consideration. Most of the employees will not be in a position to collaborate well with the suppliers using the new system. This is due to the fact that it will be majorly online and indirect as opposed to the previous direct communication using paper work. The nature of relationship is also a major factor as the new ICT system will ensure that transparency is kept in the front.

The e-Procurement landscape presents several challenges that could create interoperability concerns. Some of them are summarized in this section. J. Satyanarayana (2007) classified the challenges of e-procurement in three sides:

The buyer-side which considers the complexity of procurement procedures, the wide range of items to be procured (goods, works and services), the organization resistance, the lack of IT skills among employees and the lack of resources with government. The seller side identifies the difficulties in changing over new systems of tendering, the low levels of technological skills, the difficulties in access to site and the resistance to change. The e-procurement system side considers the difficulties in establishing and maintaining the system, the lack of financial resources for maintenance and transaction handling, the concerns of confidentiality and authenticity of bids and the varying requirements of multiple departments. Rebeca Nagels and Ravi Nath (2007) mentioned that three challenges to e-procurement implementation are related to the lack of system integration and standardization, the immaturity of e-procurement-based market services and end-users resistance.

Conceptual framework

The main focus of the study will be on the effect of E-procurement adoption on procurement process. These effects were either experienced by the staff as they carried out their duties in the ICT environment or by the organizations' capacity and supply chain factors as they received services provided with the use of ICT. The variable relationship were shown as follows:

E-procurement adoption

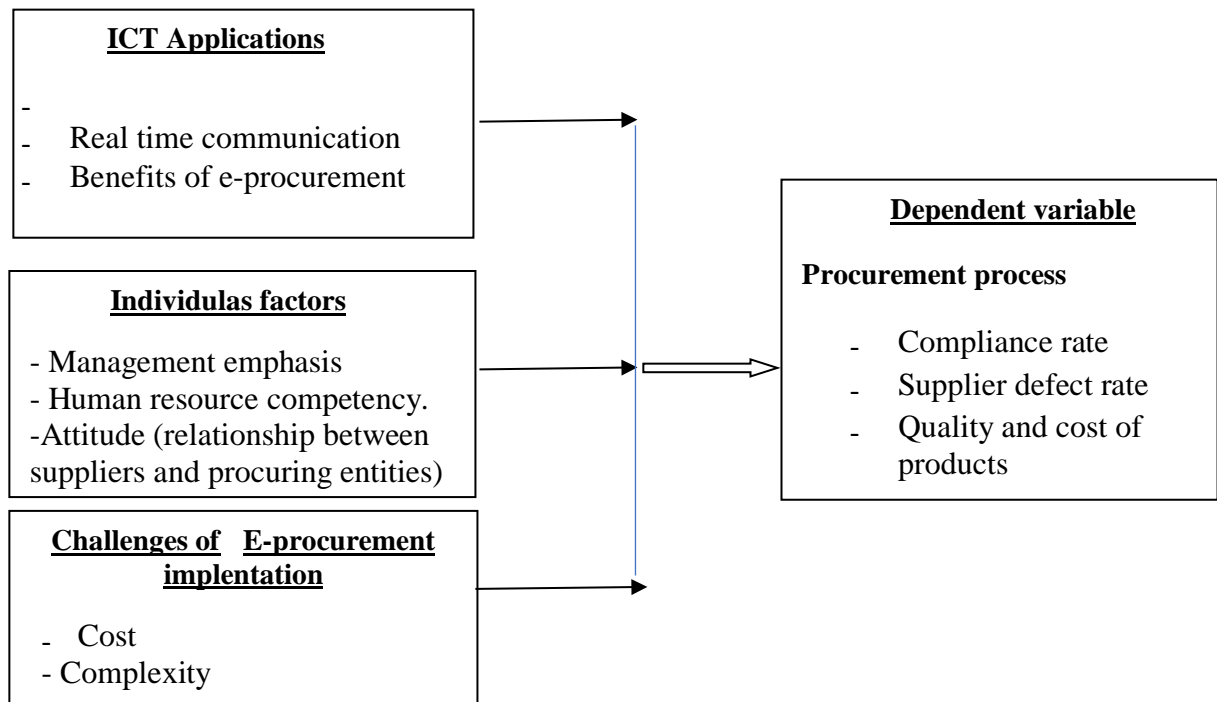


Figure 1: Conceptual Framework

Independent variable

Autommation

Source : *Researcher conceptualization , (2021)*

Research Gap

According to Schau, (2003) ICT adoption in procurement has been backed as a new strategic view of supply chain management .The innovation of employing ICT in procurement systems can create value for enterprises through utilizing. ICT enabled resources on supply chain management. Actually most of the studies conducted are general - there is no intensive industry specific research which has been conducted. These studies agree that ICT realization is a cross-industry challenge. However, the extent through which ICT adoption in procurement processes and its effects on organization is still not clear. For scholars, ICT and its adoption in procurement is an upcoming phenomenon in the business fraternity, and needs to be critically analyzed. For procurement managers, ICT adoption in procurement applications creates a need to understand the impact of information technology on the achievement of competency on a practical level.

4. RESEARCH METHODOLOGY

Research Design

Research design can be explained as the way conditions for data collection and analysis are arranged with the objective to bring economically the relevance to the research aim. (Kothari, 2004:31). The research design is the plan for data collection, measurement and analysis, therefore it is under that the conceptual structure that the research is conducted. As result, it includes the researcher's plan from writing to its operational implication and the final data analysis.

Mugenda and Mugenda (1999) concluded that the purpose of descriptive research is to determine and report the way things are and it helps in establishing the current status of the population under study; considering that the study was intended to describe and studied a single entity in depth, this study adopted a case study design.

The design is chosen for this study due to its ability to ensure minimization of bias and maximization of reliability of data that will be collected, aimed at casting light on current issues or problems through a process of data collection that enables them to describe the situation more completely. Moreover, it was chosen because it uses smaller samples for in-depth analysis. In its popular format, case study descriptive research was used also to describe characteristics or behavior of sample population (Christensen, 1991).

Target population

Population may be viewed as a body of people or any other collection of items under consideration for the research purpose (William & Grinnel, 1990).

According to O'Leary (2004) population is the aggregate membership of a distinct class of people, objects, or event. William (2005) also argues that "population is a combined word used to define the total quantity of cases of the type which are subject of your study". Therefore the study population is a complete set of individuals, cases or objects with some common observable characteristics. The targeted population of the study was composed of 54 people from District hospitals in Rwanda's staff who are closely involved in procurement operations. The population selected was considered to have a higher level of information disclosure. From Seven selected districts hospitals which were Muhima, Shyira, Remera-Rukoma, Kabaya, Rwinkwavu, Kacyiru and Rutongo were the target population.

Table 1: Target Population

Category	Target population
Chief Budget Managers (Director Generals of Hospitals)	7
Director of Unit of Medical and Allied Health Sciences	7
Director of Administration Unit	7
Logisticians	14
Procurement Officers	19
Total	54

Source: Researcher, 2021

Sample and Sampling procedure

Grinnell and Williams (1990) argues that a sample size is the number or objects in the sample. A sample can further be defined as all the people or classes selected to take part in research study. A sample size can be defined as the smallest elements collected from the target population to be able to estimate characteristics of the population (Kothari, 2004).

In order to collect information required for this assessment, a non-probabilistic sample of staff from selected District hospitals was conducted. Individuals were selected based on non-random criteria, and not every individual from District hospital had a chance of being included. Within district hospitals HR's database which lists the names and contact details of every staff was consulted. Purposive sampling method was used, the researcher used her expertise to select a sample that is most useful to the purposes of the research.

The researcher used a purposive sampling technique. With purposive sampling technique as a type of non-probability sampling, the researcher uses his/her own judgment about which respondents to choose, and picks only those who meet the purpose of the study. The advantages of purposive sampling are that, the researcher can use her research skills and prior knowledge to choose the respondents. In the purposive sampling techniques, the researcher chooses participants arbitrary for their unique characteristics, experiences, attitudes, perceptions, as conceptual or theoretical categories of participants develop during the interviewing process, researchers seek new participants to challenge emerging patterns (Cooper and Schindler, 2006).

Following covid 19 with travel restrictions, considering conclusions of Kothari, 2004 where samples of approximately 10% provides useful reliability and therefore will have a high statistical accuracy which saved resources.

The sample size for this study was 24 respondents which were staff working at selected District hospitals from Muhima, Shyira, Remera-Rukoma, Kabaya, Rwinkwavu, Kacyiru and Rutongo in Rwanda.

Table 2: Sample size

Category	Target population	Sample size	Percentage
Senior managers	7	2	28%
Head of departement	7	2	28%
Division managers	7	2	28%
Logisticians	14	4	28%
Procurement Officers	19	14	73%
Total	54	24	

Source: Resaercher, 2021

Data Collection methods and tools

According to Robert (2014), the data collection instruments are the tools used by researchers in order to collect primary and secondary data to be assessed in their researches and or studies. Therefore, this section is aiming to show the data collection techniques of the study such questionnaire, interview and documentation research techniques as follows:

The researcher collected primary data by use of questionnaire, which was a set of questions, given to the respondents within the sample population to collect primary data. The structured questionnaire was prepared; the tool was chosen because it helped to collect numerous information over a short period of time, cheap and easy to administer. The questionnaires were used to collect information from respondents in a projected time frame. All respondents were given the same sets of questions. I were composed by both close ended and open ended parts. Close ended questions are preferred because they were easy to answer and score ; while open ended questions are intended to give respondents a chance to support their opinions in a free atmosphere in addition to predetermined choices (Bogden, & Bikles, 1992).

5. SUMMARY OF FINDINGS

This study was guided by three specific objectives and their results are summarized in the following manners: to the first specific objective, the extent of ICT applications on the District's hospitals procurement processes is explained by the following: in automation of procurement process in the District Hospitals, the results show that information and technology was mainly used to a very high level in the following areas: Invitation to bid, , and selection . They were represented by means [4.21-5.00], which is interpreted as very high mean. Assessing the needs of procurement , Specification design , Bidding document preparation, contract negotiation & signing and Contract management. The means are as follows: 1.500, 1.542, 1.500,1.875 and 2.000 respectively indicating that it is a small value therefore respondents were agreeing to the same idea.

To the second specific objective, related to the relationship between the individual factors and Procurement process in District hospitals in Rwanda it was revealed that there is a positive relationship between human resource comptency in e-procurement and performance of contractors since $r = .220$, with p-value of 0.001 which is less than

0.01 as the significance level. Moreover, there is a positive relationship between Management emphasis in e-procurement adoption and procurement process

considering the $r = .308$ and the p-value of 0.020 which is less than 0.05.

To the third specific objective, To determine the challenges of e-procurement adoption on the procurement processes in District hospitals in Rwanda is explained by the following: The respondents indicated the challenges as follows: High introduction costs for new solutions (3.4583), Suppliers were slow to link up with the procurement system (3.5833), Difficulty in judging usefulness and potential of new IT solutions (3.5000), Lack of user-friendliness and user-acceptance of solutions (3.6250), Lack of qualified staff who can work with modern procurement system (3.3333), Consultant expertise is lacking in IT projects for procurement (3.5833).

6. CONCLUSION

The purpose of this study was to examine the effect of e-procurement adoption on procurement process. Based on the descriptive statistics analysis conducted it was revealed the e-procurement system adoption improved the procurement process among others the reduction of the buyer-supplier relationship that can be a source of corruption and the procurement of quality goods. The study revealed that for 87.5% respondents agreed that no relationwere between

procurement officers and Government suppliers. The study also revealed that 75% of respondents agreed to have received products of good quality at lower costs. Moreover the study revealed that among challenges faced by the district hospitals there were the cost of implementation of the e-procurement system and its complexity. Following the findings of the research, it was found that to cope with the highlighted challenges, respondents agreed on the fact to have capital investment on Technology. Early supplier involvement and capability development, Employee training, Encourage user acceptance and readiness, & Senior management Commitment.

7. RECOMMENDATIONS

For efficient e-procurement system adoption, the following are recommended to government institutions especially district hospitals:

- Procurement management and executive courses and seminars should be held to sensitize on the effect of automation on the procurement function;
- Using the e-procurement system in all procurement processes that have been automated and especially for contract management;
- Basic procurement courses should be revised to present automated contracting processes and techniques. Business and political representatives need to be educated on the dynamic changes that information technology will bring to procurement and markets;
- The e-procurement system should be enhanced and developed in a way that is more user friendly in order to reduce the resistance to change.

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