

I Influence of Technological Factors on E-procurement Adoption in Small and Medium-Size Enterprises in Nyeri County Kenya

Peter Waweru Gitonga
Technical University of Kenya, Nairobi, Kenya

Abstract

Globally Small and Medium-Size Enterprises (SMEs) have been acknowledged as having a crucial role in the development of economies. A strong SME sector can tremendously contribute to gross domestic product and generate employment, reduce poverty levels and as well promote entrepreneurial activities. Though there are various benefits of E-procurement adoption many firms, especially SMEs, are yet to adopt the technology. This is especially so in developing countries like Kenya, where E-procurement adoption is very slow. This study sought to assess the influence of technological factors on E-procurement adoption in SMEs in Nyeri County Kenya. The objective of the study was to assess the influence of technological factors on E-procurement adoption by SMEs in Nyeri County, Kenya. The Resource-Based Theory guided the study. In the study, technological factors were the independent variable, while E-procurement adoption was the dependent variable. The study used a self-administered questionnaire for data collection that was issued to 105 Small and Medium-Size Enterprise business owners within Nyeri County. A Pilot study was conducted by administering five questionnaires. Data analysis was conducted using descriptive analysis in order to determine the relationship between the variables. The results were presented in tables and the findings were discussed. Based on the findings, the study concluded that technological factors such as fear of security and confidentiality of information, absence of IT infrastructure, lack of support from system vendors and developers and lack of proper needs assessment, lack of technical expertise, and unavailability of E-procurement software affects E-procurement adoption in SMEs. The findings of this study can help in deepening the understanding of obstacles that hinder E-procurement adoption by SMEs for policymakers and form a body of knowledge for referencing to scholars. The study recommends that organizations that intend to operate efficiently have to make deliberate and sustained measures to enhance their technological factors like IT infrastructure, employee or Manager IT perceptions of information technology, and build trust regarding technology to effectively adopt E-procurement in their operations to remain competitive in their areas of operation.

Keywords: Technological factors, SMEs, e-procurement adoption

Introduction

There has been no universal definition of Small and Medium-Size Enterprises (SMEs) worldwide. Different countries have had their own discretion and most of them have used

asset values, number of employees and the business annual turnover. In Kenya, SMEs have been defined based on size, the number of employees, annual sales turnover, and their capital base, according to the SME Act 2012. The Act, however, does not explicitly define a Small and Medium-Size Enterprise. Generally, an SME can be defined as an enterprise formally registered, with an annual turnover of Kenya Shillings 8 million to Kenya shillings 100 million, has a capital base of Kenya shillings 5 million and above, and a workforce of 10 to 150 employees.

The Kenyan Vision 2030, a long-term development blueprint recognizes SMEs as critical stakeholders in achieving a transformative, industrializing and high middle-income country. Small and Medium-Size Enterprises have also been recognized as the central enablers towards achieving the 'Big Four,' which is the Kenyan government transformative agenda where SMEs are considered the 'bedrock' of manufacturing under the manufacturing pillar. Therefore, policies and business reforms that involve coming up with trade support ecosystems and capacity building at the firm level are expected to help Kenyan SMEs be more competitive – nationally, regionally and worldwide (ITC, 2019). In essence SMEs can reduce the high level of unemployment and contribute to the local economy's GDP in Kenya. Besides assisting in curbing the high level of unemployment, SMEs can transform the country by redistributing the previously disadvantaged productive assets. SMEs' failure rate is high throughout the world, with no difference from Kenya (Sharmilee and Muhammad 2016). This may be due to many factors that include entrepreneurial culture and failure to adopt technologies like E-procurement.

Globally, SMEs are known to be the engines of economic growth and development as they create employment opportunities, provide goods and services, stir innovations, and create a competitive edge for a country (Katua, 2014). The SMEs are also considered critical in attaining the United Nations 2030 Sustainable Development Agenda Goals, such as Goal 1 - To end poverty in the world in all its forms; Goal 8 – To promote inclusive and sustainable economic growth that ensures full, productive, and decent work and employment for all; Goal 9 – To create resilient infrastructure, encourage inclusive and sustainable industrialization and nurture innovation. It is out of this importance that governments consider SMEs as the centers of industrial development; thus, development strategies and policies are usually anchored on SMEs (KBA, 2016).

Small and Medium-Sized Enterprises play critical economic and social roles, especially in third world countries such as Kenya (ITC, 2019). Studies have revealed that SMEs form a high population of businesses in almost all third world countries (Katua, 2014).

According to the Kenya National Bureau of Statistics (2017), SMEs comprise about 98% of all the Kenyan enterprises; they employ more than 80% of Kenya's employees who directly derive their daily income from the SMEs. They are estimated to have contributed 34% of Kenya's Gross Domestic Product (GDP) in 2016. Small and Medium-Size Enterprises, even though generally informal, are the engines of job creation where they

generate 80% of new jobs each year (ITC, 2019). According to KBA (2016), based on a 2014 survey, 80% of the 800,000 jobs created in 2014 came from the informal sector, dominated by SMEs.

A strong SME sector contributes positively to the economy, contributing to the gross domestic product by reducing unemployment, reducing poverty levels, and promoting entrepreneurship activity. The Kenya Vision 2030 blueprint recognizes the significant roles of SMEs (Mukulungui, 2016; ITC, 2019). The Kenyan Government's Third Medium-Term Plan 2018–2022; Towards Achieving Kenya Vision 2030, distinguishes the SME segment as a critical development area. All these links well with the United Nation's 2030 Agenda for Sustainable Development, which implores the international community to promote the formalization and advancement of Micro, Small, and Medium-Size Enterprises (ITC, 2019).

Technological factors that may affect successful adoption of e-procurement include availability of internal and external technology resources, ICT infrastructure, IT expert developer support, IT compatibility with the available resources, and the complexity of the system (Mukulungui, 2016). According to the Public Procurement and Disposal Act (2015), procurement refers to "the acquisition by purchase, rental, lease, hire purchase, license, tenancy, franchise, or by any other contractual means of any type of works, assets, services or goods including livestock or any combination and includes advisory, planning and processing in the supply chain system." Procurement starts with identifying a user's need and ends with delivering the material, works, or services required and generally have four phases: requirement analysis, negotiation stage, payment phase, and contract management phase. The main aim of the procurement is to get the right product or service, at the right place, at the right time, at the right price in the most efficient manner possible (Fernandes & Vieira, 2015).

Procurement has undergone various reforms in the previous years, where technology has been incorporated in the various stages or even the entire process as a whole. When procurement is carried out with Information Communication Technology (ICT) aid, it is then referred to as E-procurement (Arasa, 2015). It refers to the use of electronic ways through the internet to fulfill the procurement activities, e.g., identification of organizational needs, payment processing, and contract management. E-procurement comprises business to business, business to customers, customer to customer, and the intra-organizational activities that aid them. Supply-side activities such as electronic procurement (E-procurement) have been identified as a critical area where Information Systems (IS)-enabled innovations are likely to yield significant organizations' significant benefits.

Many firms adopt E-procurement because of its advantages, such as expanding markets, improving customer experience, cost reduction, and enhancing efficiency and productivity (Nawi et al., 2016). E-procurement gives the ability to increase payments

systems' efficiency and growing access to formal financial services by organizations that presently lack it. Similarly, it could make the service industry, such as banks and SMEs, more convenient, and cheaper to their clients (KBA, 2016). The adoption of E-procurement implies that technology can enhance SMEs' operations, including those in Nyeri County. The SMEs can realize their goals, such as necessary enhanced infrastructure for effective service delivery and promotion of shared economic growth and job creation, which align with the Nyeri County Integrated Development Plan 2018-2022.

Research Problem

Though Small and Medium-Size Enterprises play a critical role in the global economy, regional economy, and national economy, advances in Information and Communication Technology, which lead to innovation of E-procurement, mainly acceptance by a large organization, has not seen the same level of adoption among SMEs (Kiveu & Ofafa, 2013). Organizations that fail to provide quality services are likely to experience drawbacks, such as a bad reputation, because most organizations have turned to ICT to provide competitive and quality services. The adoption of E-procurement is deemed a way of strengthening organizations to compete globally, with more effectiveness, proximity to the customer, and service provision links (Nawi, 2016). SMEs must consider ICT as a critical approach in business to grasp high ground from the markets.

Moreover, ICT is a benefit to SMEs, which may help them acquire information bearing in mind that the actual objective is to update their strength (Adeyeye, 2016). In contemporary society, the world has, to a great extent, been affected by ICT, particularly in procurement. Organizations are gradually transforming their businesses, work processes, and trade. They are also utilizing competitive strategies to win buyers and retaining quality suppliers. Many procurement departments aspire to provide quality and competitive products that reflect the value for money by implementing E-procurement in an organization (Anuar, 2015). Various studies, such as (Mukulungui 2016; Arasa, 2015), have noted that government policies and regulations are factors that can hinder the adoption of E-procurement by SMEs. These studies have not incorporated internal organizational factors in the research variables either as an independent variable. These studies have omitted internal organizational factors as critical factors that can spell doom or success for the SMEs.

The current study incorporated technological factors as an independent variable. Most studies carried out on E-procurement adoption challenges in the Kenyan context are oriented towards public procurement and government agencies, and little attention has been paid towards SMEs (Mambo & Ombui, 2015; Osir, 2016; Amemba et al., 2013). This made the researcher to develop some keen interest in this area of study. Lack of much research and findings has limited the understanding of technological factors and how they may affect E-procurement adoption in organizations, especially SMEs. It is against this background that this study attempted to assess the influence of technological factors on E-procurement adoption in Small and Medium-Sized Enterprises in Nyeri County, Kenya.

Objective of the Study

The objective of the study was to assess the influence of technological factors on E-procurement adoption by Small and Medium-Size Enterprises in Nyeri County, Kenya.

Literature Review

The study was anchored on the Resource-Based Theory (RBT). According to this theory, firms rely on their internal resources, both tangible and intangible to develop strategies that aim to improve their business performance and build their competitive advantage (Smadi & Ababneh, 2018). The Resource Based Theory further suggests that for an organization to achieve excellence and obtain external opportunities, it must exploit the internal capabilities first (Jensen & Clausen, 2017) SMEs therefore need adequate internal resource support and policies to create capability for them to growth as they are small in size and need assistance. The RBT further provides a framework to explain how business can identify suitable measures to overcome growth obstacles, have better access to technology resources, human resources, financial resources, natural, and infrastructure, and access to the market.

In this study, E-procurement is regarded as a technique that ensures available resources are optimally utilized to enhance efficiency and effectiveness in the procurement process, creating a competitive advantage for SMEs. The competitive advantage ensures that there is better lead time, cost-saving, and customer satisfaction. When E-procurement is adopted, there is better coordination and utilization of procurement resources, which leads to seamless procurement operations, which can, in return, affect the adoption of E-procurement by firms (Laryea and Ibem, 2014). The primary reasons small businesses continue to face growth challenges in developing countries, despite significant support from governments and other organizations, is their technological capabilities or lack thereof (Kolstad & Wiig, (2015). Small businesses are still hindered by their lack of technological implementation, despite tremendous technological advancements globally. Without this technology, these small businesses find it challenging to compete for neither nor grow (Kolstad & Wiig, 2015).

Mukulungi (2016) assessed the barriers to e-procurement adoption by SME's in Machakos County. The study found out that the barriers to adoption of e-procurement consisted of technological barriers such as lack of sufficient assessment of ERP systems before installations, insufficient IT infrastructure, lack of technical and competent expertise); organizational barriers (i.e., Lack of IT knowledge by management and employees, size of the firm and low staff retention) and environmental barriers (i.e., the market segment and scope of the SME's, high cost of implementation and acquisition and management perception of e-procurement). The study descriptive research design and issued a self-administered questionnaire as a means of data collection.

Sharmilee and Muhammad. (2016), investigated the factors affecting e-procurement usage by SME's in New Zealand. The study's findings showed that technological factors, i.e., relative advantage, influence the breath of e-procurement use, and compatibility affect the depth of e-procurement usage, albeit with a medium effect. The study adopted an explanatory research method and targeted SME's that are engaged in manufacturing. Small and Medium-Size Enterprises are the drivers of economies in the world. This is due to their efforts to make business innovations and promoting territorial growth (Shemi, 2012). The improved ICT penetration has brought significant changes in how business is being conducted in developed and developing countries. Globalization and accessibility of international markets have been at an all-time high, and SMEs enhance their capacities to tap into the new globalization frontier. Governments are pushing SMEs towards modernization by funding programs and developing policies that favor them (Kenya National Treasury, 2018; Republic of Kenya, 2007).

In their study, Kiveu and Ofafa (2013) found out that despite the SME's having access to information systems and the internet, their usage was shallow. They majorly use these tools for information gathering and sharing, general communication, and social networking. This shows a lack of awareness of the capabilities and opportunities that the internet can offer, especially in e-procurement and e-commerce. Further, this limited use can be associated with the alleged high costs of the required applications, applications security issues, and inadequate knowledge and skills by the users on some ICT applications.

Methodology

The study used descriptive research design in researching since this design is concerned with describing a specific individual or group's features. This design ensures the extensiveness of data and accurate, descriptive examination and characteristics of the sample, which can be used to make inferences of the population (Astalin, 2013). The study targeted SMEs operating within Nyeri town and its immediate environments in Nyeri County, Kenya. According to Nyeri County Licensing Department (2018), there are 521 registered SMEs within Nyeri town and its immediate environments in Nyeri County, Kenya as depicted on Table 1.

Table 1

Classification and Distribution of SME's in Nyeri Town

Type of Target Business	Approximate Number Registered
Large Traders, Shops, Retail or Store	405
Medium Workshop/Service Repair	54
Small Industrial Plant up to 15 Employees	34
Medium Financial Services 6-25 Employees	28
Total	521

Source: Department of Licensing Nyeri County Government (2018)

The researcher adopted stratified random sampling with proportional allocations to obtain a sample of the population. Table 2 depicts how the study sample was chosen from the stratum. Mugenda and Mugenda (2003) states that in descriptive studies, 10%-40% of the population chosen as a sample is sufficient if the sample size is large (exceeding a sample size of 30 respondents) current study, 20% of the population was used for sampling purposes. The study sample was calculated and supported by the formulae as used by Nyakundi (2018) and Omwenga and Iravo (2015) $S = (N)/X$ Where; S = required sample size, N = given population size, and X = given degree value of chosen population.

$$S = \frac{521}{20} = 105$$

The sample size was 105 distributed, as indicated in Table 2.

Table 2

Sample (size determination and distribution)

Type of Target Business	Number Registered	%	Sampled
Large Traders, Shops, Retails	405	20	81
Medium workshop/Service/Repair	54	20	11
Small Industrial Plant up to 15 Employees	34	20	7
Medium Financial Services 6-25 Employees	28	20	6
Total	521		105

This descriptive survey design was considered appropriate since the researchers intended to use descriptive statistics to analyze the collected data on tables and discussions. The questionnaire as a data collection tool was distributed personally by one researcher and a research assistant through the drop and picks an approach to the respondent's workplace to enable the gathering of primary data.

A pilot study was conducted before the actual study was done. During the pilot study, the researchers assess the instrument of data collection that was expected to be employed; this provides a chance to detect and remedy potential problems on the data collection instrument lie a questionnaire (Wasike, Sagwa & Sakwa, 2018). The pilot study was done by administering five survey questionnaires where the feedback was collected, and the questionnaires were analyzed before the questionnaire's final version was distributed. This is in line with Wachinga (2019), who asserts that a pilot study is usually conducted to test the questionnaires' validity and reliability in gathering the data required for purposes of the study.

Sekaran and Bougie (2016) aver that validity is the degree to which results obtained from data analysis represent the phenomenon studied. Validity exists in two types; content and constructs validity. By reviewing the works of other researchers, construct validity has been safeguarded in the current research. The introduction of unbiased questions on the data collection instrument ensured that there was content validity. Overall validity was achieved by carrying out a pre-test on the questionnaire so that questions that were impolite and vague were detected and adjusted appropriately. The research study was also validated through faculty panels at the Technical University of Kenya.

Before embarking on data collection, the researcher and research assistant informed the respondents that participation in the survey was voluntary, and they had the option of not participating or withdrawing from the study at any point. The respondents were asked to respond to the questions honestly. They were assured that all information they provided would be treated as confidential and the results obtained from the study will be used solely for academic purposes only.

Questionnaires were distributed to 105 respondents as per the sample of the study. Out of the 105 questionnaires, 53 were collected from the respondents representing a response rate of 51%. After checking the questionnaires, they were all found to be suitable for analysis. In earlier studies like Al-Zu'bi *et al.* (2015) yielded a response rate of 52.8%. In another related study that was carried out by Oliveira *et al.* (2011) the response rate realized was 21.4%. A study by Blome *et al.* (2014) yielded a response rate of 18.5%. The current study's response rate could be attributed to the fact that data was being collected in August and September 2020. There was the implementation of guidelines and health protocols by the World Health Organization (WHO) and the Ministry of Health in Kenya to combat the Covid 19 health pandemic. These controls limited operational hours that could have seen the study realize a higher response rate.

Once the data was collected, it was checked and processed. The data was made ready for statistical analysis by conducting validation tests and checking for clearness, legibility, relevance, and suitability. The quantitative data collected was analyzed by the use of descriptive statistics. Descriptive data analysis consisted of percentages, frequencies, means, and standard deviations that were presented in tables.

Findings

The respondents were asked to indicate the extent to which they agreed with the below statements as a factor affecting e-procurement adoption by SME's. The respondents were required to tick the appropriate box using the key provided: 1 = Not at all, 2 = Less extent, 3 = Moderate extent, 4 = Large extent, 5 = Very large extent. The findings are indicated in Table 3.

Table 3

Extent of Influence of Technological Factors on E-procurement Adoption in Small and Medium-Size Enterprises

Statement	1	2	3	4	5	Mean
Lack of staff with technical expertise and competencies affect e-procurement adoption	7	8	18	9	11	3.17
Inadequate assessment of e-procurement systems before installation affects e-procurement adoption	4	14	13	12	10	3.19
Unavailability or absence of IT infrastructure affects e-procurement adoption	9	8	4	17	15	3.40
Fear of security threats and confidentiality of information affects e-procurement adoption	6	8	10	14	15	3.45
Lack of support from system vendors and developers affects e-procurement adoption	8	6	11	15	13	3.36
Unavailability of an e-procurement solution software that is generally accepted affects e-procurement adoption	6	10	14	15	8	3.17

The findings in Table 3 indicate the extent to which the respondents agreed with the statements on the influence of technological factors on E-procurement adoption in SMEs. The statement that had the highest mean was 'Fear of security threats and confidentiality of information affects e-procurement adoption ' (mean=3.45). The statement 'unavailability followed this, or absence of IT infrastructure affects e-procurement adoption' (mean=3.40). The next statement was 'Lack of support from system vendors and developers affects e-procurement adoption (mean=3.36). The next statement was 'Inadequate assessment of e-procurement systems before installation affects e-procurement adoption' (mean=3.19). The statement that followed was 'Lack of staff with technical expertise and competencies affect e-procurement adoption ' (mean=3.17). The subsequent statement was 'Unavailability of an e-procurement solution that is generally accepted affects e-procurement adoption' (mean=3.17). These findings, which range from a moderate to a large extent, illustrate that technological factors like fear of security and confidentiality of information, absence of IT infrastructure, lack of support from system vendors and developers and lack of proper need assessment, lack of technical expertise and unavailability of e-procurement software affect E-procurement adoption in Small and Medium-Size Enterprises. These findings are corroborated with studies conducted by Smadi and Ababneh (2018) on competitive advantage and The Resource-Based Theory, which suggests that for an organization to achieve excellence and obtain external opportunities, it must exploit the internal capabilities first (Jensen & Clausen, 2017).

Conclusion

Based on the findings, the study established that there was support that technological factors influence E-procurement adoption by SMEs in Nyeri County, Kenya. The study concludes that technological factors affect E-procurement adoption in Small and Medium-Size Enterprises.

Recommendations

The study recommends that organizations that intend to operate efficiently have to make deliberate and sustained measures to enhance their technological factors like IT infrastructure, employee or Manager IT perceptions of information technology, and build trust regarding technology to effectively adopt E-procurement in their operations to remain competitive in their areas of operation.

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