

Adoption of E-procurement and Value Addition: Tanzanian context

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Abstract

E-procurement referred to the use of internet-based (integrated) information and communication technologies (ICTs) to carry out individual or all stages of the procurement process including searching, sourcing, negotiation, ordering, receipt, and post-purchase review. Even though E-procurement is not a new process but in Tanzania is at infant stage. This article aim at analysing the adoption of E-procurement and Value Addition: The Tanzanian Context. A key three factors have been reviewed and critically analysed involve which the Technological factors (T), Organizational factors (O) and Environmental factors (E) (T-O-E). Findings provided ample evidence that Tanzania can adopt e-procurement and enjoy the fruits of this new technology.

Keywords: e-procurement, TOE framework.

1. Introduction

E-procurement referred to the use of internet-based (integrated) information and communication technologies (ICTs) to carry out individual or all stages of the procurement process including searching, sourcing, negotiation, ordering, receipt, and post-purchase review (Croom & Brandon, 2004). Consequently, it is important that the value creation of e-procurement spread and emphasised that not only a web based platform and that it implicates in some beneficial changes to the procurement process (Mandela, 2007). Even though E-procurement is not a new process but in Tanzania is at infant stage (Suleiman, 2013), Sijaona (2010) has argued that the most key challenge for Tanzania to Adopt E-procurement include Policy and Legislative framework, Institutional structures, Procurement processes, ICTs and People. This is supported by (Edie et al, 2007), by discussing the main barriers for developing countries to adopt E-procurement are legal difficulties, IT difficulties and Lack of Security.

It is true that Lack of abundant and detailed elaborated research and findings on the aspect of e-procurement in Tanzanian context has result the Government to be late to adopt e-procurement and enjoy the fruits of this new technology to the public sector (Suleiman, 2013). Recognition of E-procurement in recently established Procurement Act of 2011 is a critical mile stone toward full adoption of E-procurement in Public procurement proceedings. This article aim at analysing the adoption of E-procurement and Value Addition: The Tanzanian Context. A key three factors have been reviewed and critically analysed which involve the Technological factors (T), Organizational factors (O) and Environmental factors (E) (T-O-E).

The article is structured as follows. Section 1 is the introduction. Section 2 presents a literature review. Section 3 presents the methodology used. Section 4 presents findings and discussion. Section 5 presents the conclusion and recommendations while section 6 lists all reference used.

2. Literature Review

2.1 Definition of E-procurement

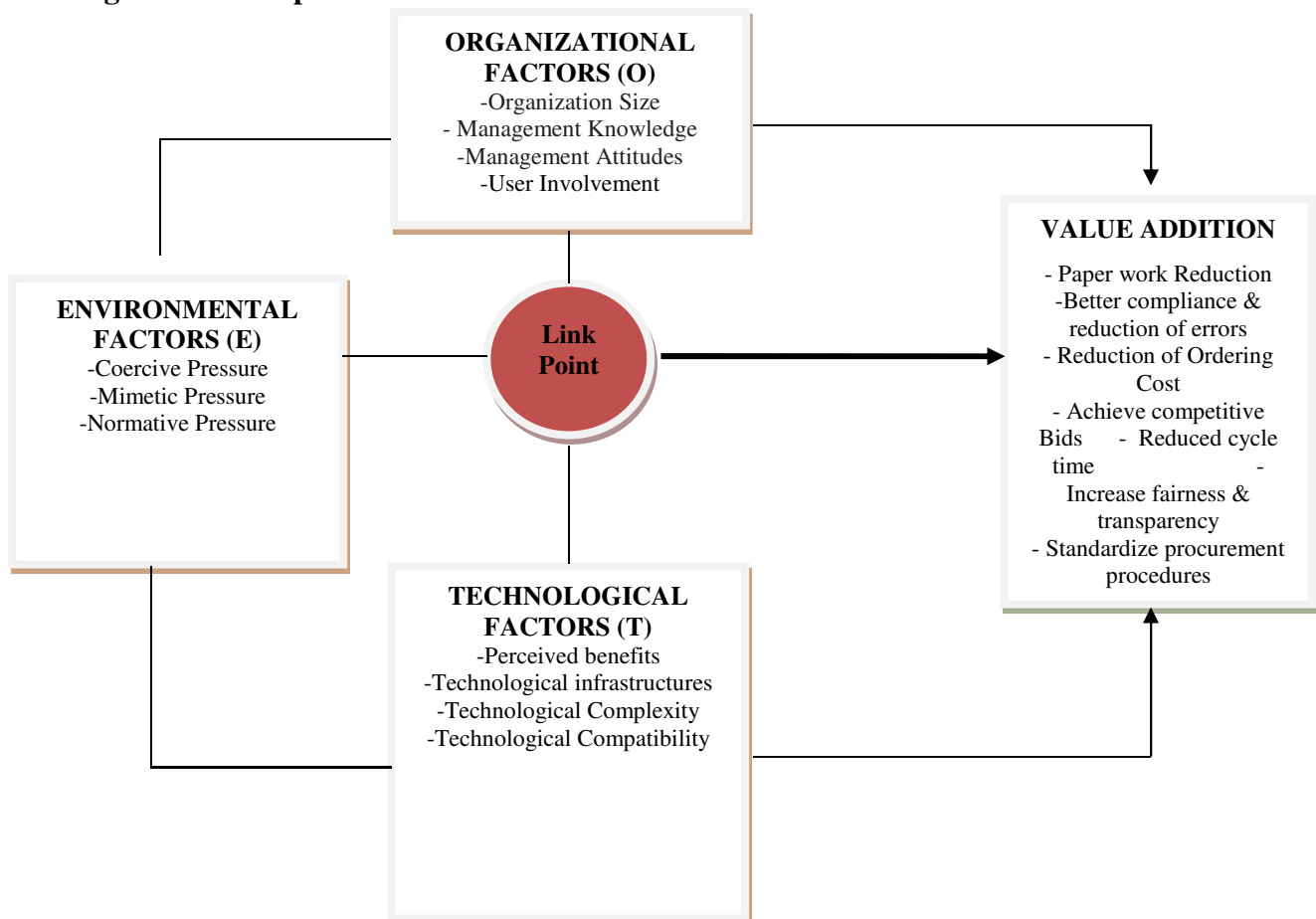
TABLE 6: Definitions of E-procurement from Different Authors

Definitions	Reference: Author(s)
1. E-procurement is the digitalization of the purchasing activities, such as search, selection, communication, bidding or awarding of contracts.	Sun et al, (2012)
2. E-procurement as integration, management, automation, optimisation and enablement of an organization's procurement process, using electronic tools and technologies, and web-based applications.	Tatsis et al., (2006)
3. E-procurement as about using the internet to operate the transactional aspects of requisitioning, authorising, ordering, receipting and payment processes for the required services or products.	CIPS, (2009)
4. E-procurement meant the integration of technological tools into purchasing activities taking place within supply chains while performing their operations.	Hatice & Mehmet, (2012)
5. E-procurement defined as purchasing through internet and other information networks.	Malcom, (2009)

2.2 Conceptual Framework

TOE framework was used in this Article to analyse the adoption of E-procurement and Value addition: Tanzanian Context. The independent variables were Technological, Organizational and Environmental factors. Figure 1 illustrates the model used.

Figure 1: Conceptual Framework.



2.2.1 Technological Factors (T)

The technology context represents the pool of technologies available to a firm for adoption. These can be both the technologies available on the market and the firms' current equipment (Scupola, 2009). The most vital elements will influence organization in Tanzania to adopt e-procurement were Perceived benefits, Technological infrastructures, Technological Complexity, and Technological Compatibility.

Perceived Benefits: These include 'direct benefits' like reduction in transaction errors and transaction costs, improved data accuracy and information quality, and faster application process. On the other hand, 'indirect benefits' associated include better customer services and improved relationship with business partners (Thomson, 2008, Karnali & Kurnia, 2011)

Technological infrastructures: Infrastructure referred to technologies that enable internet-related businesses. ICT Infrastructure had influence on the volume of a nation's Internet Transactions or on the number of e-business websites in a country. A better ICT Infrastructure enhanced e-business development (Kim et al, 2011)

Technological Complexity: Complexity relates to the level of ease with which the e-commerce technology can be understood by the firms (Vanderslice, 2000). Basically, the easier to understand the technology and its application, the faster and more immediately the adoption process and vice versa (Almoawi & Rosli, 2011).

Technological Compatibility: Compatibility defined as the degree to which an innovation was perceived as consistent with the existing values, needs, and past experiences of the potential adopter (Sarkar, 2009). Firms generally tend to adopt technologies that are in league with certain internal experiences and values, that is, technology that is consistent and within the limits of the firm and with those technologies that will become available in the future (Vanderslice, 2000)

2.2.2 Organizational Factors (O)

Organization Size: Firm size is one of the most influential factors of internet adoption among SMEs (Karakaya & Khalil, 2004). According to Uliveira & Martin,(2010), three major arguments support the positive role of firm size in determining IT adoption: the benefits of the new IT, the greater availability of funds and the quicker capture of economies of scale. Thus, larger firms tend to adopt technology at higher levels, while smaller firms are inclined to adopt technology at lower levels (Cragg & Mills, 2009).

Management Knowledge: The technological knowledge of the owner can influence the adoption of e-commerce (Dubelaar, et al, 2005) On another side of the coin Lack of technological knowledge on the owner's part would inhibit the adoption of e-procurement (Almoawi, 2011).

Management Attitudes: According to Sarkar, (2009) argue that the top management support facilitated the adoption and implementation of information systems. Almoawi & Rosli, (2011) add that the need for commitment and support from the owners or top management during the process of assessment of the innovation or technology is of utmost importance. This commitment and support ensures that there is an obligation within the resources, which in turn will create conducive environment within the firm for the adoption process of the technology.

User Involvement: User involvement also reduced resistance to changes and increases user acceptance for the new system (Sarkar, 2009). According to Suleiman, (2013), the resistance to change could occur in different context, it might appear due to asymmetry of information concerning the perceived usefulness of new technology, it might occur due to uncertainty of expected technology but also it may occur due to opportunistic of user, For instance in Tanzania there is a critical corrupt practice where by some of supplier(s) offer 10% for a return of tender, so if user will accept this new technology there is possibility to reduce that practice.

2.2.3 Environmental Factors (E)

Coercive Pressure: Empirical evidence suggested that coercive pressures on organizations might stem from a variety of sources including resource-dominant organizations, regulatory bodies, and parent corporations, and were built into exchange relationships. Organizations might also received coercive pressure from parent corporations in addition to resource-dominant trading partner (Teo et al, 2003)

Normative Pressure: According to Pani & Aghari, (2007), normative pressures were particularly relevant because the early growth stage of e-procurement was characterized by the popular hype of cost efficiency and

process effectiveness. Normative pressures could potentially hasten e-procurement assimilation across the transactional and strategic procurement processes, depended on the specific kinds of pressures exercised by entities within the business environment.

Mimetic Pressure: Mimetic pressures occurred by imitating the e-government initiatives in the advanced economies (Pani & Agrahari, 2007)

2.2.4 Value Addition

According to Mandela, (2007), Value referred to the total value created in e-procurement transactions regardless of whether it is the firm, the customer, or any other participant in the transaction who appropriates that value. Expected values/benefits are as described in Table 2 below.

Table 7: Value/Benefits of adopting e-procurement

Value/Benefits	Reference : Authors
Paper work Reduction	Hatice & Mehmet, (2012)
Better compliance & reduction of errors	Mibenge & Okoye, (2007)
Reduction of Ordering Cost	David, (2009)
Achieve competitive Bids	Gunasekaran & Ngai,(2008)
Reduced cycle time	Hatice & Mehmet, (2012)
Increase fairness & transparency	Hawking et al. (2004), Joni, (2009)
Standardize procurement procedures	Suleiman,(2013)

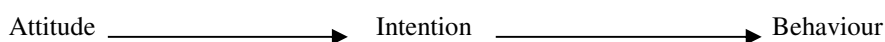
2.3 Adoption Theories

Theories used in this article were further divided on organizational adoption theories (OAT) and individual adoption theories (IAT). A combination of those theories includes:

Institutional theory (IT): Institutional theory was deemed to be the most appropriate theoretical lens to understand the factors that enable the adoption of e-procurement in an organization and suited to understand the behaviour of public organization. An institution was any standing social entity that exerts influence and regulation over other social entities (King et al, 1994).

Transaction cost theory (TCT): Transaction cost theory had been developed to facilitate an analysis of the “comparative costs of planning, adapting, and monitoring task completion under alternative governance structures”. The unit of analysis in TCT was a transaction, which “occurred when a good or service was transferred across a technologically separate interface (Williamson, 1985). The actual intensity of e-procurement application under any circumstance depended on the specific transaction circumstance. Transaction cost theory was how the organisation would go to reduce the transaction related costs. According to Pani & Agrahari, (2007) in transaction cost approach, a higher transaction frequency provided higher incentives for both buyers and sellers to improve their coordination. As such e-procurement application in the organisation decreased transaction cost by increase the potential benefits.

Theory of reason action (TRA): Ajzen and Fishbein, (1980) developed a versatile behavioural theory called Theory of Reasoned Action. This theory detailed the factors and inputs that result in any particular behaviour. Very simply, the model looks like this:



According to Singh & Kumar, (2011), an individual’s actual behaviour directly influenced by his/her behavioural intention to use. Affected by individual’s attitude towards that behaviour and subjective norm,

Attitude defined as “an individual’s positive or negative feelings about performing the target behaviour” Whereas, subjective norms defined as “the individual’s perception that most people who are important to him think he should not perform the behaviour in question”.

2.4 E-procurement in Tanzania.

Are we ready to embark on e-procurement 100%? Empirically, Implementation of 2003 policy of building National ICT Broadband Backbone (NICTBB) across the country was a critical driver toward adoption of e-procurement in Tanzania (Kowero, 2012). According to Sijaona, (2010) towards its efforts to integrate public procurement electronically Public Procurement Regulatory Authority (PPRA) has established the Procurement Management Information System (PMIS) for all public Procuring Entities (PEs) to share some data with PPRA. PMIS is a tool to facilitate exchange of information between PPRA and PEs. PMIS supports the system for checking and monitoring of procurement activities by enabling online submission of Annual Procurement Plans (APP), monthly reports and checklist forms. Furthermore, Procurement Regulatory Authority have add some new features in its website as the main indicator of evolution of e-procurement since 2010, those including Tender portal where suppliers can view all tender available, access to information concerning the award of contracts from different procuring entities (PEs)(PPRA journal, 2010)

A number of initiatives have been taken by government to enhance adoption of e-procurement on side of infrastructures. According to Kowero, (2012), the Government of Tanzania has embarked on building National information and Communication Technology Broadband Backbone (NICTBB) Project which began in 2009 with an aim of creating service point at all regional and districts of Tanzania. The number of licensed telecommunications operators increased from 5 in 2003 to 62 in 2009 (TCRA, 2011). This enables proper communication and payment through mobile money. Furthermore, increase the number of Internet Service Provider and internet cafe across Tanzania and recently signing of Cyber Crime Act of 2015 by President Jakaya Kikwete is a one step ahead toward adoption.

Unfortunately, until yet Tanzania face a vast of challenges which hinder both public and private organizations to adopt e-procurement. According to Liang, (2007) and Mark, (2011) Tanzania affected much by ‘Financial challenges’ -Cost of connectivity via VSATs are still high, ‘Organisational challenges’ - Technical support for Tele-centres is often inadequate and weaknesses in the quality of leadership, ‘Cultural challenges’- Resistance to change is reported in some organizations, ‘Connectivity problems’: poor infrastructure for communications, power and transport. According Suleiman (2013) has categorised those challenges on six areas such as ‘Policy framework challenge’-Lack of an overall ICT Policy and poor harmonization of initiatives had previously led to the random adoption of different systems and standards, ‘Regulatory framework challenge’- regulatory environment in building capacity to maintain a proactive legal framework that could keep pace with the rapidly changing telecommunication technology and e-procurement environment, ‘Cyber security challenge’- threats to data, equipment, networks, and people. The legal environment in Tanzania is still inadequate for cyber security in the country, ‘Procurement legal framework challenge’- The basic commercial laws in Tanzania are derived from the 19th century, and New PPA of 2011 and its regulations of 2013 does not support in advance the application of e-procurement. ‘Inappropriate technology challenge’- lack the necessary technical know-how and experience to deploy the most appropriate technologies, and ‘Power supply challenge’- Poor electricity supply was a major problem. Efficient power supply in Tanzania is only guaranteed by power generators. Therefore the use of information technology for executing procurement process would be a problem; also the connectivity of internet is not reliable and includes power off of electricity “mgao wa umeme” as a nation critical problem.

Embarking on e-procurement 100% in Tanzania is steal a paradox.

3. Research Methodology

Qualitative approach was used to gain a clear understanding and explore the reality on how adoption of e-procurement influenced by T-O-E in Tanzania. Data was collected from both side primary and secondary source, primary data was gathered mainly through questionnaires that were administered to a different response but purposively with the required information and secondary data was obtained from articles in academic journals, published books, search engines, internet using search tools like Google Scholar and Google search engine.

Non-probability sampling was used to obtain a representative sample from different intellectual background of public institutions in Tanzania. Data were collected from Dar e salaam, Zanzibar, Morogoro and other regions of Tanzania. Primary data collected from the questionnaires was summarized, coded and processed by using statistical package for social science (SPSS for windows version 20.0).

4. Findings and Discussion

Table 3: Rating of Characteristics influencing adoption of e-procurement in Tanzania

Adoption Characteristics of e-procurement	Strongly disagree	Agree	Neutral	Disagree	Strongly Disagree
Compatibility characteristics					
1. Fitness of Business Operations	6(12.8%)	20(42.6%)	17(36.2%)	4(8.5%)	4(8.5%)
2. Fitness of business partners operations	4(8.5%)	5(10.6%)	18(38.3%)	18(38.3%)	2(4.3%)
3. Fitness of existing information system	3(6.4%)	20(42.6%)	19(40.4%)	5(10.6%)	-
Complexity characteristics					
1. Easy for employees	6(12.8%)	19(40.4%)	13(27.7%)	9(19.1%)	-
2. Clear and understandable to business partners	1(2.1%)	8(17%)	21(44.7%)	15(31.9)	2(4.3%)
3. Using additional e-procurement is easy for employees	3(6.4%)	7(14.9%)	13(27.7%)	22(42.6%)	2(4.3%)
Technological infrastructures characteristic					
1. Enough computers	33(70.2%)	7(14.9%)	1(2.1%)	5(10.6%)	1(2.1%)
2. Connected to National fibre optic	13(27.7%)	19(40.4%)	9(19.1%)	2(4.3%)	4(8.5%)
3. Firm existing infrastructures	13(27.7%)	22(46.8%)	4(8.5%)	7(14.9%)	1(2.1%)
Perceived Benefits					
1. Reduction of transaction costs	2(4.3%)	25(53.2%)	15(31.9%)	4(8.5%)	1(2.1%)
2. improved the data accuracy	6(12.8%)	31(66.0%)	8(17%)	2(4.3%)	-
3. Increase installation costs and administrative cost	3(6.4%)	13(27.7%)	25(53.2%)	6(12.8%)	-
Organization Size					
1. In-house IT infrastructure, expertise and skills	29(61.7%)	8(17.0%)	3(6.4%)	7(14.9%)	-
2. IT experience	17(36.2%)	18(38.3%)	6(12.8)	5(10.6%)	1(2.1%)
3. Financial resources Availability	16(34.0%)	14(29.8%)	11(23.1%)	5(10.6%)	1(2.1%)
Management Attitudes					
1. Resources allocation for e-procurement	9(19.1%)	20(42.6%)	9(19.1%)	7(14.9%)	2(4.3%)
2. Top management awareness	12(25.5%)	24(51.1%)	10(21.3%)	-	-
3. Employees Encouragement	1(2.1%)	20(42.6%)	19(40.4%)	5(10.6%)	2(4.3%)
User Involvement					
1. Employees involvement	4(8.5%)	22(46.8%)	13(27.7%)	7(14.9%)	1(2.1%)
2. Effective participation of employees	14(29.8%)	24(51.1%)	6(12.8%)	3(6.4%)	-
Coercive Pressure					
1. Regulatory body	12(25.5%)	9(19.1%)	14(29.8%)	8(17.0%)	4(8.5%)
2. Trading partners	-	7(14.9%)	14(29.8%)	18(38.3%)	8(17%)
3. Country ICT law	-	6(12.8%)	25(53.2%)	15(31.9%)	2(4.3%)
Mimetic Pressure					
1. Suppliers pressure	2(4.3%)	5(10.6%)	19(40.4%)	11(23.4%)	10(21.3%)
2. Alert of e-procurement opportunities	11(23.4%)	14(29.8%)	19(40.4%)	3(6.4%)	-
3. Competitive Pressure.	5(10.6%)	31(66.0%)	8(17.0%)	2(4.3%)	1(2.1%)
Normative Pressure					
1. Suppliers Enforcement	-	6(12.8%)	11(23.4%)	23(48.9%)	7(14.9%)
2. Core value (Efficiency & Effectiveness)	-	29(61.7%)	16(34%)	2(4.3%)	-
3. Enforcement from Customers	-	5(10.6%)	12(25.5%)	6(12.8%)	24(51.1%)

Source: Research Data, 2013.

Table 4: Rating of Characteristics of Value obtaining by adopting e-procurement in Tanzania.

Value/Benefits	Strongly disagree	Agree	Neutral	Disagree	Strongly Disagree
1. Paper Work Reduction	34(72.3%)	10(21.2%)	1(2.3%)	2(4.3%)	-
2. Better compliance and reduction of Error	17(36.2%)	22(46.8%)	6(12.8%)	2(4.3%)	-
3. Reduction of Ordering cost	10(21.3%)	31(66.0%)	4(8.5%)	2(4.3%)	-
4. Achieve competitive bids	14(29.8%)	17(36.2%)	13(27.7%)	3(6.4%)	-
5. Reduced Cycle Time	7(14.9%)	26(55.3%)	11(23.4%)	3(6.4%)	-
6. Increased Fairness and Transparency	18(38.3%)	18(38.3%)	10(21.3%)	1(2.1%)	-
7. Standardise Procurement Procedures	7(14.9%)	29(61.7%)	10(21.3%)	1(2.1%)	-

Source: Research Data, 2013.

4.1 Discussion

Compatibility characteristics: The analysis show e-procurement is compatible with most organizations business operations and existing information of those organizations but was not compatible with the supplier business operations, the analysis were consistence with the literature read, adoption of e-procurement become difficult in either upward stream or downward stream of the organization. On this study it shows that e-procurement adoption is more difficult on side of upward stream.

Complexity characteristics: The analysis of this show that adoption of e-procurement is easy for internal employees to adopt it but it is difficult for supplier to adopt new system due to lack of adequate knowledge and cost of operations.

Technological infrastructures characteristic: This analysis showed that the existing technological infrastructures in most Tanzanian organizations was sufficient enough to start practice e-procurement because, majority organization they possess enough computers, had already connected to national fibre optic and also they had good firm infrastructures that support e-procurement adoption.

Perceived benefits characteristics: Generally the analysis showed that through adoption of e-procurement in an organization perceived benefits of reduction of transaction cost, improved data accuracy and cost of administration was reduced in procurement activities.

Organization Size: The analysis show that the majority of the organization is ready to embark on e-procurement in terms of existing in-house IT infrastructure, expertise and skills they have in their organizations, IT experience and financial resource capability.

Management attitudes: The finding of the study was consistency with the literature read, the adoption of e-procurement in any organization need support from the top management, further more the analysis showed that top management was enough aware of the e-procurement opportunities, encourage their employees to practice e-procurement and also allocate enough resource to enhance adoption of e-procurement.

User involvement: The analysis showed that by adopting e-procurement the organization would increase employee involvement and participation in procurement activities, and this would create transparency in procurement activities.

Coercive Pressure: The analysis showed that the only coercive pressure from procurement regulatory body (PPRA) has enforce the Government of Tanzania and PEs to start using e-procurement but it is far on side of business partners and also the country law(public Procurement Act) is still silence on that.

Mimetic pressure: The analysis showed that the only mimetic pressure that derives organizations to adopt e-procurement was competition in the market and willing to increase market share.

Normative pressure: The analysis revealed the literature read that the only mimetic pressure that drives the organization to adopt e-procurement is core value of effectiveness and efficiency. Furthermore the analysis shows that both downward stream and upward stream did not enforce the organization to adopt e-procurement.

Value Addition: The analysis showed that through adoption of e-procurement the organizations would reduced paper work reductions, achieve better compliance of procurement procedures and reduction of errors, reduction of ordering cost, achieve more competitive bids, reduction of cycle time in procurement process, standardize procurement procedures and increase the efficiency and transparency in procurement activities.

5. Conclusion

The results of this study shed an interesting insight about e-procurement adoption in Tanzania. The study used TOE framework as a key determinants toward adoption of e-procurement in any country. The study has provided ample evidence that Tanzania can adopt e-procurement and enjoy the fruits of this new technology. The researcher recommends the following; first, the Government of Tanzania should improve the legal infrastructure such as privacy law, e-signature and other cybercrimes law in order to reduce the crime through e-transaction. Secondly, Continued focused on improving technical infrastructure is necessary for fully operation of e-procurement, procedures and internal systems which support e-procurement and lastly, e-procurement is a complex application require great cautious from adopters.

This study was conducted to explore the factors influencing adoption of electronic procurement in Tanzanian public institutions based on TOE framework. The researcher would suggested that for further research, one would focus only on single factor either Technological factors, Organizational factors or environmental factors instead of conducting using all three variables.

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