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PERCEIVED BENEFITS OF PARTICIPATION IN PUBLIC ELECTRONIC PROCUREMENT: A COMPARATIVE ANALYSIS OF VENDORS IN ILALA DISTRICT, TANZANIA

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ABSTRACT
Public electronic procurement (PEPS) is an emerging technology in public procurement for efficiency and value assurance. Vendors' participation has been un-avoidable for true realisation (benefits) of PEPS; however, studies are still inconclusive regarding perceived benefits contributions on participation for participants and non-participants vendors. This study therefore did a comparative analysis on perceived benefits contributions for participants and non-participants vendors' participation in PEPS. The study adopted across-sectional research design and Ilala District was a study area. Simple random sampling technique was used to select 300 respondents with 73 participants and 227non-participants vendors. A purposive sampling technique used to select three key informants, each one from Public Procurement Regulatory Authority (PPRA), Government Procurement Service Agency (GPSA) and Medical Stores Department (MSD). The structured questionnaire and Key informant Interview guide were used for collecting quantitative and qualitative data respectively. Quantitative data used multiple response analysis and independent samples t-test for analysis while content analysis technique analysed qualitative data. The Findings have revealed a significant difference ($p < 0.05$) between participants and non-participants on perceived benefits (transparent, paper reduction, cost control and corruption control). The study therefore concludes that, perceived benefits have contribution for vendors' participation in PEPS. The study recommends to non-participants vendors to consider participating in PEPS in order to gain significant perceived benefits. The study also to PPRA to make sure the PEPS offer the perceived benefits for vendors' participation. This can be done once the system stakeholders improve impacting benefits knowledge to vendors, hence attracts more vendors to participate in PEPS.

Keywords: Vendors, Participation, Perceived benefits, Electronic Procurement

1.0 INTRODUCTION
Procurement is among of the major aspects of an enterprise to improve supply chain management and hence enterprise performance. The introduction of the Internet has introduced public e-procurement system hence changed the way procurement is done (Husin *et al*., 2019; Gurakar and Tas, 2016). E-procurement refers to the purchase of goods, works and services for organisations with the application of internet-based information and communication technology (ICT) (Husin *et al*., 2019). Public e-procurement implementation initiatives have been undertaken on a large scale (Wold bank [WB], 2016; Kim *et al.*, 2015; WB, 2014) as government procurement represents 15% to 20% of the world Gross

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Domestic Product (GDP). As per the benchmark report by Wirtz *et al*. (2009), public procurement spends increased by 17%, while the average requisition-to-order cycles having reduced by 12.4 days, maverick spend reduced by 16 % and requisition to-order costs reduced by 34%, the potential savings range between Euro 15 and 75 billion Euros by German budget. Studies done in European countries and Korea noted that, the use of public e-procurement was mainly successful due to vendors' participation in public e-procurement system (Afolabi *et al.,* 2019; Chong *et al.,* 2018;Gascó *et al.,* 2018).Furthermore, success of public e-procurement due to participation of vendors was also noted in India, where Lewis-Faupel *et al*.(2016); Panduranga (2016) found significant perceived benefits like minimising procurement transactional cost and transparent increase on public procurement operations.

In Africa, scholars like Mutangili (2019); Eskandarin (2016), revealed that, the use of e-procurement lead to numerous perceived benefits like lower costs, quality improvement, lead time control, transparency and corruption control. Ashrafi, (2014) also documented the benefits which the organisation can acquire once the use of e-procurement system employed, these includes, enabling faster access to information, saving in supply chain, improves the skills of employees and creation of competitive advantages. Furthermore, Harelimana (2018) and Prempeh &Nsiah (2017) revealed significant impacts and factors for e-procurement systems' implementations which includes saving on estimated budget, paperwork reduction, procurement procedures standardisation, transparency improvement, negotiation support, effective change management, improve efficiency, save time and life cycle, improve contract management and reduction in administrative costs. However, little has been done to determine the contribution of these perceived benefits for vendors' participation in public e-procurement between participants and non-participants vendors.

In Tanzania specifically, the previous Public Procurement Act (PPA 2001 and PPA 2004) was purely supporting paper-based system where procurement undertakings did not recognise electronic procurement (Mlinga, 2018). But a new legislation PPA 2011 and its amendments of 2016, allowed the introduction of public e-procurement system in the country, where joint effort between government and vendors were recommended for better use of the system and meet the targeted objectives (Mlinga, 2018). Public e-procurement makes the procurement of goods, works and service more transparent in budget formulation, but also has implications for the accuracy of budget realisation information by vendors participating (Bakar *et al.,* 2016). Furthermore, public e-procurement system acts as a control system for vendors' budget execution by making a more reasonable cost estimate than the cost of the budget ceiling (Yano, 2018; Chebii, 2016).Scholars proved that, vendors' participation is vital for public e-procurement system's successful implementation and realisations on perceived benefits documented(Seo and Warman, 2018; Iles, 2017; Mwemezi, 2015).

However, the puzzle noted was impact's variation on perceived benefits for participation in public e-procurement system between participants and non-participating vendors. While the scholars includes Tutu and Kissi(2019); Brimkulov and Baryktabasov(2018);Sarpong *et al.*(2017); Makoba and Eliufoo(2017) and aforementioned, documented perceived benefits for adoption of e-procurement and proved to attract more to adopt, but there is a missing contextual and theoretical framework whether perceived benefits has any contribution for participation in public e-procurement system between participants and non-participants vendors. Therefore, this study compared the perceived benefits impacts for participation in public e-procurement system between participants and non-participants vendors. The study guided by null

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(H_o) hypothesis:*"There is no difference on Perceived benefits for participation in public e-procurement system between participants and non-participants vendors do not differ"*

The study was guided by Participation Theory by Midgley *et al.* (1986) and Technology Acceptance Model (TAM) postulated by Davis (1989). The choices of the two theories are justified by presence of technological acceptance motives and community engagement in government projects for successful implementation. Both theories realising relative advantages (perceived benefits) as the main motive for acceptance of new technology or any project.

The Participation theory as postulated by Midgley *et al.* (1986)include a move from the global, spatial and top-down strategies that dominated early development initiatives to more locally sensitive methodologies. The participation theory argued that, the world is suffering on lack development due to poor community involvement in development decisions, implementation and benefits (Midgley *et al.*, 1986). Participation is the process through which stakeholders' influence and share control over priority setting, resource allocations, policy-making and access to public goods and services, in the current study, participation theory meant involvement of the vendors in the implementation of the public e-procurement project. Furthermore, Ross *et al*.(2000) suggested that, participation and participatory processes stem broadly from two major areas: political sciences and development theory. The current study introduced public e-procurement system, has both political and development motives for improving efficiency and effectiveness of public procurement operations, hence the theory found relevant.

Further, Johnson and Walker (2000) identified the main reasons on why participation does not occur in practice includes professionalism, economic, political and the nature of the product. The economic reasons for non-participation involve cost benefit calculation. The benefits must be greater than the costs of participating, where from the current study; perceived benefits for public e-procurement compared for examining magnitude difference on how fostering participants and non-participants for participation in government e-procurement project, also TAM model adopted for the construct of technological acceptance level among vendors' due to the presence of perceived benefits on it.

The Technological Acceptance Model (TAM) formulated by Davis was also applied in this paper. The TAM model by (Davis,1989: 2003)is based on The Theory of Reasoned Action and the Theory of Planned Behaviour. The TAM model argued that, the acceptance and use of technology are influenced by relative advantage (perceived benefits) which includes Perceived usefulness (relevant to use), ease of use(free from effort) and the attitude towards the use of the system (Surendran, 2012). The perceived benefits which are perceived usefulness, ease of use was significant factors of actual system use (Mayasari *et al.*, 2017). Perception of vendors on the usefulness and ease of use of e-procurement system is very critical in realising the full benefits of public e-procurement adoption and implementation (Venkatesh *et al.*, 2012).

TAM model as the technology acceptance motives is based on two main assumptions; perceived usefulness of the system such as; paperless, transparency, improved performance, enhanced productivity, effectiveness and efficiency in operations and the perceived ease of use of the new systems such as ease to use, ease to learn, ease to control and ease to remember. This theory therefore, brings an understanding that acceptance and use of new technology are a function of the users' feelings about the system and its

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perceived benefits (Rotich and Okello, 2015). This study, therefore, adopted the main construct models, which is:Perceived benefits (perceived usefulness) as the comparison base of its foster participants and non-participants vendors in public e-procurement system participation.

2.0 METHODOLOGY

This study was conducted in Ilala District. The study area has been selected due to the presence of 1110 eligible vendors out of 9740 countrywide (equivalent to 11.4%) (URT,2018). The study took purposefully vendors with a framework agreement contract with the government through Government Procurement Services Agent (GPSA) as expected timely participate in public e-procurement system (URT, 2018). Because they were the one, shown already interest in doing business with government and expected to comply with public procurement directives timely on the usage of public e-procurement system.

The cross – sectional research design was preferred because it helped on controlling conditions of the study by capturing the state at the moment, facilitate snapshot at a large population used to generalise the findings, allow the use of variety analytical techniques, allow the use of mixed methods for data collection, interaction of one variable over another at a time and collection of data were done once, hence, saved time and cost(Flick, 2011; Creswell, 2009).

The study had a sample size of 300 respondents, after the calculated minimum sample size of 286 respondents by Cochran (1977) finite population formula,

$$n = \frac{no}{1+(no-1)/N} = \frac{384}{(1+384)/1110} = 286 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where, n is sample size, n_o is unknown population, N is known population.

The Simple random sampling technique was used to select 300 respondents whereby a random number generated from the vendors list obtained from GPSA for Financial Year 2018/2019 (URT, 2018). The 30 rule of thumb and 5:1 ratio as recommended by VanVoorhis and Morgan(2007) for comparison on unbalance groups on their respondents' numbers was adopted. The sample of 300 respondents for this study obtained from GPSA database for homogeneity on resources and interest to trade with government, where participants were 73 and non-participants were 227vendors. The current study adopted 5:1 ratio due to small number of 400 registered vendors in the system, up to August, 2018 out the 9740 vendors (4.12%) countrywide (URT, 2018). The 5:1ratio number, also supported by the comparison study done by Alomar and Visscher (2019), about e-procurement acceptance factors between 695 small to medium-sized enterprises (SMEs)and 126 large companies (which was 1:5 ratio) as the current study.

Purposive sampling technique was used to select key informants, which were public e-procurement system focal personnel and officials from Government Procurement Service Agency (GPSA), the Public Procurement Regulatory Authority (PPRA) and Medical Stores Department (MSD).Both qualitative and quantitative techniques were used to collect data in order to control the biases inherent in a single technique (Creswell, 2009). Quantitative data were collected by using the survey method with a structured questionnaire. A total of 300 questionnaire copies were administered to vendors' representatives in the Ilala District. Qualitative data were collected using Key Informants Interview (KII).

A total of 3 interviews were conducted with the help of the Key Informant Interview guide to public e-procurement system experts from Public Procurement Regulatory Authority (PPRA), Medical Stores

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Department (MSD) and Government Procurement Services Agency (GPSA) whom were empowered to introduce and monitor public e-procurement system (commonly known as Tanzania National electronic Procurement System (TANePS)). The analysis of qualitative data was done stage-wise by recording, transcribing, categorising, coding (axial one) and grouping themes related to the benefits of public e-procurement usage by vendors thereafter analysed using content analysis technique.

Quantitative data were analysed using multiple response analysis and independent sample t-test to make a comparison on perceived benefits contribution for participation in public e-procurement system between participants and non-participants vendors. The independent sample t-test was preferred because it is among preliminary statistically model in comparing means between two independent samples. The independent sample t-test compares means for two unrelated groups on the same continuous dependent variable. For the data reduction purposes, Factor Analysis using Principal Component Analysis (PCA) and Varimax rotation with cut-off loading of 0.5 (50%) was adopted. This process involved inspecting Kaiser- Meyer- Olkin (KMO) and Bartlett's test of the sphere city measure of sampling adequacy in order to evaluate the appropriateness of the data for factor analysis.

Table 1: Confirmatory Factor Analysis, Reliability and Validity for Perceived Benefits indicators

Perceived Benefits (Indicators)	Initial Eigenvalues	Factor loading range	Cumulative variance	Cronbach's Alpha	AVE	CR	KMO	Bartlett's Test
			55.27%	0.897	0.746	0.917	0.897	P<0.001
Improve efficiency	*55.270*	*0.807*						
Support negotiation	*10.710*	*0.790*						
Limit paperwork system	*7.827*	*0.787*						
Transparency	6.622	0.778						
Standardise procurement	5.522	0.769						
Decrease Corruption	4.446	0.758						
Improve on report writing	3.494	0.671						
Work done timely	3.354	0.666						
Control Costs	2.754	0.643						

NB: Correlation matrices>0.00001 indicating absence multicollinearity, AVE=Average Variance Extracted, CR=Composite Reliability

Bartlett's test was p<0.001, a significant probability level indicating that there is an association between variables. Besides, the KMO value 0.897 was higher than the threshold of 0.6 (Darko *et al.*, 2017), indicating that sample is acceptable for further analysis see Table 1, which also proved acceptable

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reliability and validity threshold for data used in the study, were Cronbach's Alpha ≥ 0.7, construct reliability (CR) ≥ 0.6 and Average Variance Extracted (AVE) ≥ 0.5 (Hooper *et al.*, 2008). The study dropped 5 items out 14 items, due to required factor loadings above 0.50, cumulative variance above 50% and eigenvalue above 1 (Hair *et al.*, 2010), hence 9 items were retained for further analysis. The effect size statistics (ETA squared) were thereafter applied to provide a magnitude of the differences on perceived benefits between the two compared groups. ETA squared ranges from 0 to 1 and represent the proportion variance in the dependent variable that explained by independent groups (Pallant, 2011). The ETA squared value' interpretations were made using the guidelines proposed by Cohen (1988) that 0.01=small; 0.06=moderate; 0.14=large magnitude

$$Eta\ Squared = \frac{t^2}{t^2+(n_1+n_2)} \quad \ldots\ldots (2)$$

Where: t= test score, n_1=Sample size of participant, n_2=Sample size of non-participant

4.0 FINDINGS AND DISCUSSIONS

4.1 Perceived benefits for vendors' participating in public e-procurement system

The Perceived benefits used in this study relate to the level of recognition of the relative benefits that the public e-procurement system can provide to the organisation (vendor). The current study identified perceived benefits as one of the most critical success factors for the participation of vendors in public e-procurement system. Vendors have been sensitised to participate, yet participation is not convincing. Therefore, this raises doubts as to whether they are well informed on the associated benefits with the integration and usage of the respective system.

Table 2: Perceived Benefits acceptance level between Participants and Non-Participants vendors

	Indicators	Combined (n=300)		Participants (n=73)		Non-Participants (n=227)	
		Frequency	Percent (%)	Frequency	Percent (%)	Frequency	Percent (%)
Perceived Benefits	Decrease corruption	283	94.3	70	95.9	214	94.3
	Paper work system	286	95.3	71	97.3	215	94.7
	Standardise procurement process	290	96.7	69	94.5	218	96.0
	Improve transparency	285	95.0	70	95.9	215	94.7
	Improve efficiency	291	97.0	70	95.9	219	96.5
	Support negotiation	286	95.3	71	97.3	215	94.7
	Enable work done timely	289	96.3	71	97.3	218	96
	Control cost	290	96.7	69	94.5	217	95.6
	Improve on report writing	286	95.3	71	97.3	215	94.7

The findings in Table 2 indicate that, both participants and non-participants agreed on each perceived benefit indicator by above 90% acceptance level. These findings imply that, participants and non-participants vendors recognise the positive contributions of public e-procurement system. The scholars like Alomar and de Visscher (2019); Brandon-Jones and Kauppi (2018); Zhou *et al.*, (2018),also argued that, perceived benefit on e-procurement system has positive impact to participants on transparency, costs controls, maverick buying reduction, reduced administrative costs, less paper work, contracting time

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reductions by 40%, reduce prices of goods and services, increase efficiency and effectiveness, improve customers services, speed up operations, reduce corruptions and lastly enhanced control and monitoring of public procurement process. Theoretically, both Participation Theory and TAM model, indicated that the perceived usefulness (benefits) and perceived ease of use, were the main drivers for individual to accept or reject a given technological system, which quite different for the current study as both parts (participants and non-participants) accepted the usefulness of the system, yet low number participated, hence study recommend on this accordingly.

4.2A Perceived benefits among Vendors in Public e-procurement System

This study used independent sample t-test striving to identify whether there are differences on perceived benefits impact for participation in public e-procurement system between participants and non-participants vendors. The independent sample t-test in Table 3 shows that there was a significant difference on perceived benefits impact between participants and non-participants vendors for participation in public e-procurement system; this implies that, participants are more likely to continue participating in public e-procurement system compared to the counterpart. The assumption for Leven's test for equality variance (test for homogeneity of variance assumption) stated that, if the significance value (P) >0.05, then you should use 'equal variance assumed' but if the significance value (P) =0.05 or ≤ 0.05, this means that the variance for two groups are not the same, then use 'equal variance not assumed' for results interpretation (Pallant, 2013).

Table 3: Perceived benefits between participants and non-participants

		Levene's Test for Equality of Variances		t-test for Equality of Means						
Perceived Benefits (Indicators)		F	P-value	T	Df	P-value	M. D	S. E Difference	95% C.I of the Difference Lower	Upper
Decrease corruption	Equal variances assumed	2.431	0.120	2.023	298	0.044	0.214	0.106	0.006	0.421
Paper work system	Equal variances assumed	2.279	0.132	2.110	298	0.036	0.222	0.105	0.015	0.430
Standardise procurement	Equal variances assumed	1.745	0.188	2.126	298	0.034	0.218	0.103	0.016	0.420
Improve transparency	Equal variances not assumed			2.599	194	0.010	0.226	0.087	0.054	0.398
Improve efficiency	Equal variances assumed	2.328	0.128	2.329	298	0.021	0.245	0.105	0.038	0.452
Support negotiation	Equal variances assumed	2.674	0.103	2.416	298	0.016	0.254	0.105	0.047	0.461
Enable work done timely	Equal variances not assumed			2.990	199	0.003	0.262	0.088	0.089	0.435
Control cost	Equal variances assumed	2.498	0.115	2.241	298	0.026	0.236	0.105	0.029	0.443
Improve on report writing	Equal variances assumed	3.435	0.065	2.014	298	0.045	0.221	0.110	0.005	0.438

Significant p< 0.05, C.I-Confidence Interval, M.D= Mean Difference, S.E= Standard Error

The current result found 7 indicators' Leven's test being significant at value > 0.05, therefore, equal variance assumed retained for interpretation at t-test for equality of means and the 2 indicators found

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Leven's test being significant at value p< 0.05, hence, equal variance not assumed line was used for t-test interpretation. Where from Table 3, perceived benefits indicators used in this study, found decrease corruption (t=2.023, p=0.044), paperwork reduction (t=2.110, p=0.036), standardise procurement (t=2.126, p=0.034), improve transparency (t=2.599, p=0.010), efficiency support (t=2.329, p=0.021), support negotiation (t=2.416, p=0.016), work done timely (t=2.990, p=0.003), control costs (t=2.241, p=0.026) and improve report writing (t=2.014, p=0.045). The all perceived benefits indicators found significant at p>0.05, which implies that, perceived benefit is a key ingredient for vendors to participate in the system, but also the participants are only the one who can feel it. This results supported by the Participation theory and TAM model assumptions which stated, for individual to accept the technological system or government project, there must a relative advantage (perceived benefit) expected. In order to determine the magnitude of the difference between participants and non-participants vendors for perceived benefits contribution on participation in public e-procurement system, the ETA squared analysis was conducted.

Table 4: ETA Square analysis results on the magnitude difference between participants and non-participants for perceived benefits contribution for public e-procurement

	Decrease corruption	Limit paperwork system	Standardise procurement process	Improve transparency	Improve efficiency	Support negotiation	Work done timely	Control costs	Improve report writing
ETA Square yield	0.0136	0.0147	0.0149	0.0222	0.0179	0.0192	0.0291	0.0166	0.0134

The findings in Table 4 revealed that, the differences between participants and non-participants on accepting perceived benefits for participation in public e-procurement system were small, range between 0.01 to 0.06 and statistically significance. Where by Cohen (1988) the interpretations of ETA squared value were 0.01=small; 0.06=moderate; 0.14=large magnitude. This results is contrary to what was assumed by the Participation theory and the TAM model, that by participants and non-participants vendors agree on perceived benefits should triggered much participation in public e-procurement, but the study observed a minimal rate of participants vendors compared to non-participants vendors. The findings of this study aligned with the study done by Dhaoui (2019), who documented that, participants vendors in public e-procurement system can achieve direct and indirect benefits includes easily access information and improve quality of information which very important in competitive world and excluded non-participants vendors from benefiting. Furthermore, one of key informants supported the study results as quoted saying that:

> *There is no doubt that vendors who accepted the public e-procurement system gained financial relief (costs control) and improved on time management compared to those who did not accept the system yet* (GPSA, TANePS Expert)

This implies that, benefits attained from public e-procurement system will retain participants to keep participating, but non-participating required to participate in order to gain the same. In addition, studies by Yu *et al.* (2015) and Ashrafi*et al.*(2014) also found that participants vendors have a good chance to do their procurement operations successful with controlled costs relative to their counterparts (non-

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participants vendors). This view was also supported by one of the key informant interviewed as quoted saying:

> *Vendors are striving to win competitive tenders opportunities and those who are registered (participating) get all information at their fingertips, hence, acquire a wide knowledge on what the market want and being more competitive with a lot savings compare to those not registered (non-participants vendors)* (MSD,TANePS Expert,).

Further, the study finding supported by others more scholars, who ascertained the perceived benefits for the public e-procurement system, includes Vaidya and Campbell (2016); Eei *et al.*(2015); Kim *et al.* (2015), who found that, vendors participating in public e-procurement system are more likely to save costs, which proved to accounts 1% on saving for supply costs and up to 20% per tender cost due to accurate, reduced lead time for open tenders saved by 39.7% and restricted tenders saved by 34.7% and quick decision made on acquiring procurement opportunities timely as assumed by TAM model and Participation theory for participation. This view was confirmed by key informant interviewed from different institutions with their provided statement:

> *Public e-procurement system allows accepting stakeholders (participants' vendors inclusive) to put things in common, hence speed-up operations pertaining procurement which count as the heart of our economy also widen markets(*PPRATANePS personnel).

> *With public e-procurement system things become easier and more affordable; vendors who participated are the one assured to gain these benefits* (GPSATANePS personnel).

Both statements given by key informants from different institutions, imply that, public e-procurement system assure stated perceived benefits and participants vendors are more likely to gain those benefits than non-participants, hence ague vendors to participate. This study findings holds the theoretical claim true since perceived benefits had significant difference with the counterpart, which implies that acceptance of technological system or government project (public e-procurement system) depend much on knowledge for perceived benefits for the given system or project, participants are the one in best position to reap the worthiness of it than the counterpart.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The study conclude that, there is a significant difference on perceived benefits (improved transparency, efficiency, report writing, corruption decrease, costs control, reduction of paper-work system, report writing, standardise procurement, negotiation support and work done timely) for participation in public e-procurement system between participants and non-participants vendors. Therefore, it is recommended to vendors that, they should continue participating in public e-procurement system in order to gain the benefits associated with public e-procurement system.

The study also recommend to the system controller (PPRA) to make sure the surveyed perceived benefits are attained all the time by vendors participating in the public e-procurement as they stand as cause for them to participate. This can be done by providing guidance on public electronic procurement and spread knowledge to vendors on promised benefits by public e-procurement system so as to attract more vendors to participate in it.

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Further, it is recommended that non-participants vendors should consider participating in public e-procurement system for better position of winning the competitive tendering, to enable them to maximise their market share, cost minimisation and generate more income for their stability.

The recommended further study should be done to highlight factors attracts vendors to participate in public e-procurement systems, due to the fact that, perceived benefits expected to pull them in the system but the result found contrary. By doing so, it will enrich the level of understanding for the policy makers and PPRA as the system developer to invest scarce resources for the best practices and implementation on public e-procurement system.

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