



Determinants of Effective E-Procurement System: Empirical Evidence from Indonesian Local Governments

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STOPE, pengadaan secara elektronik, akuntabilitas, transparansi, efisiensi, efektivitas.

ABSTRACT

This study investigates the effect of the strategy-technology-organization-people-environment (STOPE) variables on the effectiveness of e-procurement implementation in improving accountability, transparency, efficiency, and effectiveness of local governments in Indonesia. The population of this study is local government procurement services (or LPSE) in Indonesia. The sample, 96 LPSE, was selected using simple random sampling method. The data was collected through questionnaires distributed via email to 289 LPSE. The respondents were 33 managers and 63 information technology professionals of local government procurement services (33% response rate). Partial least squares (PLS) was used to analyze the data and test the hypotheses. The findings showed that strategies, objectives, integration between organizations and systems, and human resource assistance can improve the accountability, transparency, efficiency, and effectiveness of the government in implementing procurement activities.

Determinan Sistem E-Procurement yang Efektif: Bukti Empiris dari Pemerintah Daerah di Indonesia

ABSTRAK

Penelitian ini menguji pengaruh variabel strategy-technology-organization-people-environment (STOPE) terhadap efektivitas implementasi e-procurement dalam meningkatkan akuntabilitas, transparansi, efisiensi, dan efektivitas pemerintah daerah di Indonesia. Populasi penelitian ini adalah layanan pengadaan secara elektronik (LPSE) pemerintah daerah di Indonesia. Sampel penelitian yaitu 96 LPSE, dipilih menggunakan metode pengambilan sampel acak sederhana. Data dikumpulkan melalui kuesioner yang didistribusikan melalui email resmi 289 LPSE terpilih. Responden penelitian adalah 33 manajer dan 63 IT Profesional dari layanan pengadaan pemerintah daerah (tingkat respons 33%). Untuk menguji hipotesis dan analisis data digunakan metode Partial least squares (PLS). Hasil penelitian menunjukkan bahwa strategi dan tujuan, integrasi antara organisasi dan sistem, dan bantuan sumber daya manusia dapat meningkatkan akuntabilitas, transparansi, efisiensi, dan efektivitas pemerintah dalam melaksanakan kegiatan pengadaan.

1. Introduction

The development of information and communication technologies as well as the internet not only affect the activities of providing products and services of a business to consumers

(B2C), but also affects the provision of products and services of a business to other business (B2B). One of the B2B activities is the procurement of goods/services. In line with the development of technology, the organization's

need for a system that facilitates goods/services procurement is also increasing. The need for this system does not only occur in private organizations, but also in government organizations (Engström et al., 2009). To accelerate the development progress, the innovation of government procurement of goods/services that utilize information technology is necessary. This innovation is commonly known as electronic procurement (e-procurement).

E-procurement is one of the innovations of e-government. Based on the E-Government Development Index (EGDI) ranks of the United Nations 2018, Indonesia's rank is 107 EGDI and ranks 7th in Southeast Asia (Statista.com, 2018). Indonesia's ranking is still far below the countries in Southeast Asia such as Singapore (ranked 7th EGDI), Malaysia (ranked 48th EGDI), Brunei Darussalam (ranked 59th EGDI), Thailand (ranked 73rd EGDI), Philippines (ranked 75th EGDI), and Vietnam (ranked 88th EGDI).

Gunasekaran & Ngai (2008) define e-procurement as the process of purchasing goods/services electronically that needed for an organization's operations. The process encompasses the initial need identification and specification by users, through the search, sourcing, and negotiation of contracts, trigger payment, and support post-supply evaluation (Croom & Brandon-Jones, 2005). According to Gebauer & Shaw (2004), large organizations generally recognize the benefits of e-procurement for three reasons.

Firstly, end-user involvement in the procurement process alleviates the operational tasks of the procurement group. It ensures compliance with the company's purchasing procedures. Secondly, benefits are derived from automation in paper-based processes (i.e., cost savings). Finally, the companies report the benefits of increasing the information transparency function. E-procurement also can reduce barriers regarding efficiency and stimulate

the participation of vendors (Reis & Cabral, 2018). E-procurement adoption is relied on to be the primary element to control today's complex supply chain systems of the organizations (Jain et al., 2018).

Choi, Park, Rho, & Zo (2016) who assess the application of e-procurement in Indonesia found that improvements in physical and institutional infrastructure are the most important measures to improve e-procurement systems to overcome challenges and avoid failures. Based on the Ministry of Finance's Financial Education and Training Agency (2014) there are various findings and reports from the auditing apparatus that show many deviations from the procurement of goods/services. The practices of this deviation include bribery, breaking up or merging packages, inflating prices, reducing the quality and quantity of goods/services, direct appointment, collusion between providers and managers. In addition to the Corruption Eradication Commission (2017), corruption concerning the procurement of goods/services was the highest case in 2004-2009 and became the second in 2010-2017.

The activities in the procurement of goods/services in government organizations are an important concern because they consider funding sources, one of which comes from compulsory community contributions, namely tax. Therefore, in its implementation, the government not only needs to be accountable and transparent but also prioritizes efficiency and effectiveness. Hence the benefits of e-procurement are getting maximum.

Consideration is, therefore, needed regarding the factors that can affect the effective implementation of e-procurement. These factors include strategy, technology, organization, people, and the environment. These factors, known as the STOPE framework, were first developed by Bakry (2004). STOPE is a formulation that is initiated to provide a basis for the development and continuous improvement of e-government services. STOPE is an extension of the TOE framework (technology, organization,

environment) by adding elements of strategy and people. This extension shows that the adoption of an innovation in an organization is not only influenced by technological, organizational, and environmental aspects but also by the strategies and human resources that support its implementation.

Previous research examined the effect of STOPE variables on the implementation of e-government with the case of e-procurement in Indonesia (Choi et al., 2016). However, no study discussed the effect of STOPE variables on the effectiveness of implementing e-procurement in improving accountability, transparency, efficiency, and effectiveness. This study fills the research gap by investigating the effect of STOPE variables on the effectiveness of implementing e-procurement in improving accountability, transparency, efficiency, and effectiveness of Local Governments in Indonesia.

Data collection was conducted with an online survey of 96 local governments in Indonesia. The findings show that strategies and objectives, integration between organizations and systems, and human resource assistance can improve the accountability, transparency, efficiency, and effectiveness of the government in implementing procurement activities.

2. Literature review

Several studies have examined the implementation and impact of e-procurement in the public sector of various countries (Ahmad et al., 2019; Choi et al., 2016; A A Costa et al., 2013; Croom & Brandon-Jones, 2005; Rotchanakitumnuai, 2013). Ahmad et al., (2019) examined the experience of Jamaica's Government e-procurement to combat corruption by leveraging information and communications technology (ICT). As in Indonesia, public procurement in Jamaica faced an issue regarding transparency and accountability because its operation uses public funds. The findings show that positive sentiments about intervention

through transparency will overcome the negative sentiments about governments regarding the operation of the e-procurement system.

Choi et al., (2016) assessed the implementation of e-government in developing countries based on the STOPE formulation developed by Bakry (2004) with e-procurement case studies in Indonesia. The results show that improvements in physical and institutional infrastructure are the most important measures to improve e-procurement systems to overcome challenges and avoid failure. Previous studies have found that the e-procurement process has a positive impact on accountability, transparency, efficiency, and effectiveness (Judith Gebauer & Shaw, 2004; Rotchanakitumnuai, 2013).

The government's accountability and transparency attitude in the implementation of e-procurement is shown by the government's commitment and responsibility in the implementation process. With the support of information technology, each provider can access the information of auction and participate in the process of auction anywhere and anytime. Also, the benefits that can be obtained are cost and time efficiency. The process of e-procurement omits the use of paper for providers and budget users (Nurmandi & Kim, 2015). Providers access the information of auction through the website and upload documents to applications provided by the government, namely electronic procurement systems (SPSE).

STOPE was first developed by Bakry (2004) based on Technology, Organization, Environment framework (TOE) to introduce e-government among various issues concerning the digital economy. STOPE consists of five elements, namely, strategy, technology, organization, people, and environment. It is expanded by adding a strategy and people element from the TOE framework. STOPE framework has been used in a variety of different information system domains to support the development, transition, integration, or evaluation of different information

technology problems (AlHogail & Mirza, 2014). The explanation of the five elements of STOPE that are used as references in this study was adapted from (Choi et al., 2016). Strategy refers to the process of determining the overall objectives and then supporting the government to improve the possibilities.

Technology refers to the level of knowledge and specific skills in an organization needed to provide reliable support by the system. In contrast, an organization refers to the preparation and ability of the organization in organizing a new system to ensure that the new system is aligned with the organization. Further, People refer to employees' education and encouragement to obtain the appropriate capacity and are committed to sustainably adopting and implementing systems. Finally, environment refers to issues that lead to the characteristics of a country and the circumstances of the institution.

Al-Osaimi, Alheraish, & Bakry (2008) identified strategies as directions, commitments, and plans relating to the development and utilization of information and communication technology. Bakry (2004) explained that strategies related to vision are demonstrated by the adoption of digital economics and missions, which are shown by obtaining economic benefits. Susanto, Muhaya, Almunawar, & Tuan (2010) use the strategy element in STOPE to determine the State's strategy regarding future industrial development and services.

AlHogail & Mirza (2014) use strategic dimensions related to objectives, policies, practices, standards, and guidelines of information security to guide organizational members to protect information assets. In government organizations, procurement of goods/services is conducted as effectively as possible to account for public funds. Therefore, the government needs to devise a clear strategy and objectives so that the implementation of e-procurement in government organizations can run effectively.

The study conducted by Choi et al., (2016) regarding the implementation of e-procurement in Indonesia found that the appropriate and consistent objectives and strategies play an important role as it leads to a successful implementation. The study shows that organizations need to have a clear strategy and objectives because these are the determinants of organizational sustainability. Clear strategies and objectives are devised so that local governments can achieve the objectives of e-procurement.

According to Presidential Regulation No. 16/2018, the objectives of government goods/services procurement are to produce the right goods/services from every money spent, measured from the aspect of quality, amount, time, cost, location, and provider. The regulation encourages the use of domestic products, the participation of micro business, small business and medium business, and to encourage economic equality and sustainable procurement. The regulation provides clear objectives of government goods/services procurement that can be used by local government in implementing their e-procurement, therefore:

H₁: Clear strategies and objectives have a positive effect on the effectiveness of implementing e-procurement in local government organizations.

Walker & Harland (2008) explained that companies could adopt technology as part of a business strategy that can contribute to improving company performance and competitive advantage. When an organization adopts a technology, the organization must consider whether technology can improve the competence of the organization, or it can destroy organizational competence (Baker, 2012).

Technology infrastructure in e-government must be adequately considered. Technology cannot be adopted for the sake of the technology itself but must be well prepared according to the needs of the organization. Each organization has different technological needs. The appropriate

technology to support services from e-government is needed to achieve good quality and integration (Bakry, 2004).

To complement the policy regarding e-government, in 2006, the government of Indonesia issued a policy relating to the use of ICT, which indirectly strengthen policies in the development of government (Rokhman, 2011). Since then, local governments have continued to innovate in the provision of goods/services with the use of ICT. The use of ICT in the procurement of goods/services is expected to increase the effectiveness of the government in public procurement activities.

Bromberg & Manoharan (2015) examined the official websites of the 191 largest cities in the United States. They found that cities with both IT capacity and a council-manager form of government, are more likely to be in an advanced stage of e-procurement development. E-procurement conducted by the government requires information technology that can support the process, such as websites, applications, and systems that can maintain user security. Proactive government organizations can use the enormous potential of internet technology by being more responsive to the needs of the community (Mcivor et al., 2002).

H₂: Technology readiness has a positive effect on the effectiveness of implementing e-procurement in local government organizations.

Issues regarding organization are related to the handling of resources and the management of an activity (Saleh et al., 2007). The organization needs to integrate new systems to align with organizational objectives because when an organization grows, each department experiences difficulties in various types of products, services, customers, and geographical areas (Wang & Li, 2014). Choi et al., (2016) stated that for e-government systems to fit into existing systems and vice versa, organizations must be prepared

and able to regulate new systems to ensure that new systems are aligned with the organization.

Integration between government organizations and e-procurement systems is related to system adjustments that have been implemented in organizations with new systems. Local governments need to adapt existing systems within organizations with e-government systems. If the old system uses manual methods in the procurement process, it is necessary to adjust to the system carried out by utilizing ICT. This is aligned with the Presidential Regulation No. 16 the Year 2018 that the procurement of government goods/services is conducted using information and communication technology, as well as electronic transactions.

Moreover, local governments need to use electronic systems to ensure more effective procurement activities. When integration between the organization and the system is going well, the implementation of e-procurement will be more effective.

H₃: Integration between organizations and systems has a positive effect on the effectiveness of implementing e-procurement in local government organizations.

AlHogail & Mirza (2014) explain that human behavior is influenced by three domains of factors: readiness, responsibility, and management. Readiness is achieved through training, awareness, skills, and practice. Responsibilities include security views and perceptions, acceptance of employee responsibilities, respect and prevention, and monitoring and control. Management includes factors such as assistance, practice, and effective communication with superiors.

Bakry (2004) explained that in elements of people, awareness is needed for users, understanding is needed for managers, and training is needed for information technology personnel. This also applies to government organizations as service providers for the

community. Assistance for human resources such as awareness, understanding, and training is needed so that the government can further improve its services to the community. The procurement administrator is required to have specific competencies in the procurement sector. Human resources involved in the procurement of goods/services in the local government are known as the working unit of goods/services procurement (or UKPBJ).

This unit is divided into two sub-units, namely, procurement service units (or ULP) and electronic procurement services (or LPSE). The authority and duties of ULP are related to the coordination of the general plan for the procurement of goods/services. At the same time, the LPSE is related to the management of the procurement system. The better of the assistance of human resources that manage e-procurement activities, the implementation of e-procurement will run effectively.

H₄: Human resource assistance has a positive effect on the effectiveness of implementing e-procurement in local government organizations.

Hossain, Rana, & Dwivedi (2015) explained that government regulation could have beneficial and adverse effects. If regulation is complied with by all parties involved, this can have a good impact. In Indonesia, local governments must comply with applicable regulations because every public service activity carried out by local governments must comply with the provisions in the regulation. Local governments in Indonesia are compliant with rules, not yet towards innovation in management.

The government procurement of goods/services procedures are regulated in Presidential Regulation No. 16 (2018). If all parties involved in government procurement of goods/services comply with this regulation, it is certain that the procurement of goods/services can be carried out more effectively. Research conducted by Choi et al., (2016) found that in the

case of e-procurement in Indonesia, environmental factors are critical because the environment in which the e-procurement system is implemented has not been adequately prepared or missed from expectations, especially in institutional matters.

H₅: The institutional environment has a positive effect on the effectiveness of implementing e-procurement in local government organizations.

According to Presidential Regulation No. 16 the Year 2018 concerning Procurement of Government Goods/Services, procurement of goods/services must apply the following principles: efficient, effective, transparent, overt, competitive, fair /not discriminatory, and accountable. This is due to considerations regarding the expenditure and use of public funds. Good governance in the public sector focuses on transparency and maximizes benefits for the State and society consistently and fairly.

Accountable means that the implementation of procurement of goods/services electronically follows the rules and regulations that applied so that they can be accounted for. Transparent means that all provisions and information regarding the procurement of goods/services are clear and can be widely known by potential vendors of goods/services and by the public in general.

Transparency and accountability are the goals and means of successful governance (Wang & Li, 2014). When government procurement of goods/services is conducted manually, there is often lobbying between the government and the provider. However, after being done electronically, it is not permitted to have face-to-face meetings between the government and the provider until the contract signing occurs.

Therefore, the more effective the implementation of e-procurement, the higher the accountability and transparency of the government to the public. Research conducted by Rotchanakitumnuai (2013) used a survey with a

sample of 67 government agencies in Thailand that provides evidence that the e-procurement process has a positive impact on transparency and accountability. The survey of 1200 public organizations in Portuguese conducted by Costa et al., (2013) provide evidence that the implementation of e-procurement can improve the transparency process. Costa & Tavares (2014) state that if properly designed and implemented, the e-procurement platform can provide an easy and transparent source of information to every procurement company.

H₆: The effectiveness of e-procurement implementation can improve local government accountability in carrying out public procurement activities.

H₇: The effectiveness of e-procurement implementation can improve local government transparency in carrying out public procurement activities.

One of the objectives of government goods/services procurement Presidential Regulation No. 16 (2018) is to produce the appropriate goods/services from every money spent, measured regarding quality, quantity, time, cost, location, and provider. This objective is closely related to efficiency.

E-government has the potential to impact many aspects of government, which may lead to greater effectiveness and efficiency (Bromberg & Manoharan, 2015). Efficient means the procurement of goods/services must be endeavored by using minimum funds and effort to achieve the quality, target, and time set. It also means using the funds that have been set to achieve maximum quality and objectives. E-procurement automated the traditional paper-based procurement into online acquisition, so it

makes something convenient for government vendors (Soong, Ahmed, & Tan, 2019).

Effective means the procurement of goods/services must be following the needs and targets that have been set and provide maximum benefits. When government procurement of goods/services is still done manually, providers must come to the local government to see auction announcements and prepare documents in physical form.

In contrast, when done electronically, service providers only need to access auction announcements through electronic procurement services websites (LPSE) and upload documents to applications provided by the government. When the implementation of e-procurement runs efficiently and effectively, the objective of procuring government goods/services will be achieved.

Gunasekaran & Ngai (2008) surveyed the 276 companies in Hong Kong and found that the e-procurement strategy emerged as a powerful tool to achieve the objectives of reducing costs and increasing productivity. A case study was conducted by Gebauer & Shaw (2004) found that e-procurement has an operational impact on process efficiency. Rotchanakitumnuai (2013), surveying 67 government agencies in Thailand, finds that the e-procurement process has a positive impact on cost-effectiveness.

H₈: Effectiveness of the implementation of e-procurement can improve local government efficiency in carrying out public goods/services procurement activities.

H₉: Effectiveness of the implementation of e-procurement can increase the effectiveness of the local government in carrying out public goods/services procurement activities

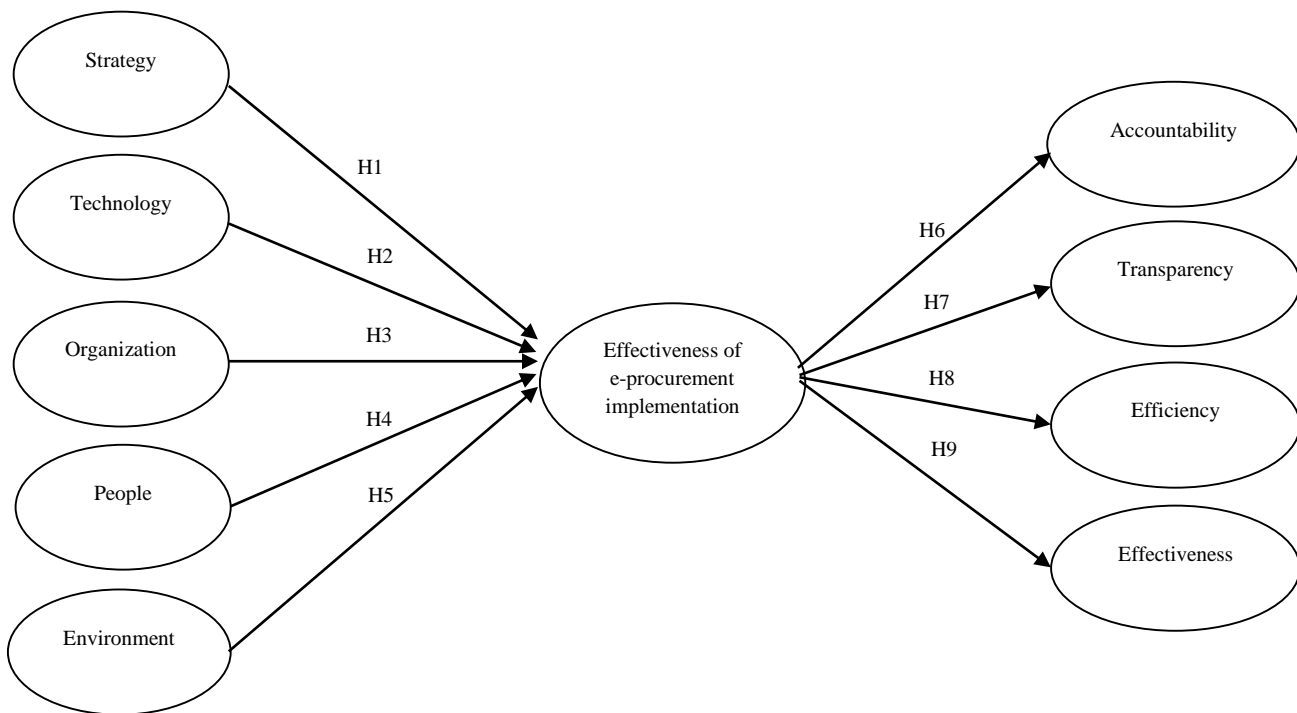


Figure 1. Research model

3. Research method

Data collection was conducted with an online survey. Questionnaires were distributed via e-mail to 289 local government procurement services (or LPSE) in Indonesia. The total population of local governments in Indonesia is 514, but only 289 local governments provided email contacts on their LPSE website. We used probability sampling with a simple random sampling method.

Respondents are 33 managers and 63 IT Professionals of local government procurement services (96 local governments). Ninety-six local governments responded with a response rate of 33%. Groves (2006) stated that there is no

minimum response rate below which survey estimates are necessarily subject to bias. E-mail addresses are obtained based on the LPSE website of each region. Voucher incentives were given for 20 lucky respondents. Pilot tests were conducted on 37 respondents involved in e-procurement activities.

The analysis technique used is PLS. PLS is an alternative estimation approach to SEM. The advantages of PLS lie mainly in its robustness, and its estimation approach handles both very small and very large samples with more ease than does SEM (Hair et al., 2010). The variables studied were adapted from previous studies and Presidential Regulations (Table 1).

Table 1. Definition of variables

Construct	Indicator	Definition	Source
Clear strategy and objective	STR	Clear strategies and objectives, authority, and political commitment of the local government.	Choi et al., (2016)
Technology readiness	TECH	Readiness, technical competence, and security and privacy of technology in e-procurement implementation in local government.	Choi et al., (2016)
Integration between organization and	ORG	Capacity, suitability, and process of organizational integration in dealing with change from manually to	Choi et al., (2016)

system		electronically in local government.	
Human resource assistance	PEO	Education of employees and support of users and stakeholders in local government.	Choi et al., (2016)
Institutional environment	ENV	Resources for maintaining information technology infrastructure, institutional conditions (law and regulation), and social background (demography, history, culture, economics, and politics) in local government.	Choi et al., (2016)
Effectiveness of the implementation of e-procurement	EPROC	The impact of technology, organization, and environment on the effectiveness of e-procurement implementation in local government.	Ali & Green (2007)
Accountability	ACCN	The availability and capacity of the organization to be responsible for its practices, do what it promises, monitor its practices, and improve if there is a policy violation of e-procurement implementation in local government.	Jaatun, Pearson, Gittler, Leenes, & Niezen (2016) and Presidential Regulation No. 54 the Year 2010
Transparency	TRANS	Transparent in obtaining all information and provisions provided by the local government for the procurement of goods/services electronically to society.	Presidential Regulation No. 54 the Year 2010
Efficiency	EFCN	Cost and time savings of e-procurement implementation in local government.	Harris, Anderson, & Shafron (2000) and Presidential Regulation No. 54 the Year 2010
Effectiveness	EFCT	Long-term objectives, benefits, and obstacles in e-procurement practice in local government.	Denison & Mishra, 1995) and Presidential Regulation No. 54 the Year 2010

To test the validity of research instruments, we used convergent validity, discriminant validity, and average variance extracted (AVE). Composite reliability and Cronbach Alpha were used to test the reliability of research instruments. To test the hypothesis, we used partial least squares (PLS) as the alternative of structural equation modeling (SEM).

4. Results and discussion

Validity and reliability tests

Samples were collected based on an online survey of 96 local governments. After sample

collection, this study tested the validity and reliability to test the research instrument. A validity test is conducted with convergent validity, discriminant validity, and average variance extracted (AVE).

The value of loading on convergent validity indicates the extent to which the indicators used contribute to the construct measured. All factor loading should be 0.5 or higher, and ideally, 0.7 or higher (Hair et al., 2010). Table 2 shows that each indicator has met convergent validity (> 0.7).

Table 2. Convergent validity

Construct	Indicator	Loading
Accountability	ACCN 1	0.785
	ACCN 2	0.824
	ACCN 3	0.817
Effectiveness	EFCT 1	0.880
	EFCT 2	0.722
	EFCT 3	0.803
Efficiency	EFCN 1	0.895
	EFCN 2	0.786
	EFCN 3	0.763
Environment	ENV 1	0.730
	ENV 2	0.788
	ENV 3	0.788
Effectiveness of the implementation of e-procurement	EPROC 1	0.892
	EPROC 2	0.890
	EPROC 3	0.910
Organization	ORG 1	0.901
	ORG 2	0.939
	ORG 3	0.911
People	PEO 1	0.928
	PEO 2	0.924
	PEO 3	0.874
Strategy	STR 1	0.955
	STR 2	0.966
Technology	TECH 1	0.875
	TECH 2	0.838
	TECH 3	0.828
Transparency	TRANS 1	0.899
	TRANS 2	0.939
	TRANS 3	0.936

Discriminant validity shows the extent to which a construct is different from other constructs. The variance-extracted estimates should be greater than the squared correlation estimate. It is based on the idea that a latent

construct should explain more of the variance in its items measures that it shares with another construct (Hair et al., 2010). Table 3 shows that the variance-extracted is greater than the squared correlation.

Table 3. Discriminant validity

	ACCN	EFCT	EFCN	ENV	EPROC	ORG	PEO	STR	TECH	TRANS
ACCN	0.809									
EFCT	0.718	0.804								
EFCN	0.577	0.569	0.817							
ENV	0.702	0.633	0.445	0.769						
EPROC	0.652	0.743	0.592	0.626	0.897					
ORG	0.570	0.570	0.251	0.664	0.612	0.917				
PEO	0.339	0.454	0.463	0.386	0.534	0.239	0.909			
STR	0.641	0.621	0.298	0.668	0.613	0.653	0.289	0.961		
TECH	0.677	0.602	0.296	0.766	0.570	0.750	0.251	0.697	0.847	
TRANS	0.331	0.448	0.281	0.224	0.417	0.349	0.494	0.225	0.271	0.925

AVE indicates whether an item actually measures the construct of the item. An AVE of 0.5 or higher is a good rule of thumb suggesting adequate convergence and less than 0.5 indicates that on average, more error remains in the items than the variance explained by latent factor structure imposed on the measure (Hair et al., 2010).

The reliability test is conducted by composite reliability and Cronbach alpha. composite reliability should be higher of 0.7. Cronbach's alpha should exceed a threshold of 0.70, but 0.60 can be used in exploratory research (Hair et al., 2010). This study has met the criteria for validity and reliability.

Table 4. AVE, Composite reliability, cronbach alpha

	AVE	Composite reliability	Cronbach alpha
ACCN	0.654	0.850	0.736
EFCT	0.647	0.845	0.733
EFCN	0.667	0.857	0.753
ENV	0.592	0.813	0.657
EPROC	0.805	0.925	0.879
ORG	0.841	0.941	0.906
PEO	0.827	0.935	0.895
STR	0.923	0.960	0.917
TECH	0.718	0.884	0.809
TRANS	0.855	0.947	0.915

Nonresponse bias

The main problem in the survey is not obtaining responses to the distributed questionnaires. It can cause nonresponse bias. In this study, the method for assessing nonresponse bias was by measuring the amount of nonresponse bias that might be eliminated by post-survey adjustment (Groves, 2006). It was conducted by dividing the two groups of respondents.

The first group was the respondents answering the questionnaires within the first two weeks when it was distributed. The number of the first groups was 60. Furthermore, the second group respondents answered the questionnaire within the last two weeks after the researcher sent the questionnaire back as a reminder to the respondents. The number of the second group was 36. The results of the t-test for all variables show higher (>0.05), which means that there is no difference between the two groups of respondents. It can be concluded that in this study, there was no response bias.

Common method bias

The other biases that can occur in research are common method bias (CMB). CMB often occurs when the data collection method is carried out using a questionnaire. Some sources of CMB result from the predictor and criterion variables are obtained from the same source or rater. In contrast, others are produced by the measurement items themselves, the context of the items within the measurement instrument, and/or the context in which the measures are obtained (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Gorrell et al. (2011) stated that CMB occurs when the answer of the respondents' questionnaire do not reflect their thoughts about the phenomenon being asked. It is caused by an individual tendency to present themselves in a favorable light, regardless of their true feelings about an issue or topic (Podsakoff et al., 2003). We used one of the most widely used techniques by researchers to address the CMB; it is Harman's single factor test. The result of the percentage of variance shows the value of 39.68% ($<50\%$). It

can be concluded that there is no threat of common method bias.

Results of data analysis and discussion

Respondents are dominated by men (85%), with ages between 30 and 39 years old (48%). Sixty-six percent (66%) of respondents are IT

Professional, while thirty-four percent (34%) are managers of local government procurement services, and they already have a certificate of goods and services procurement. Respondents' working period is mostly above five years (46%) with bachelor education (58%).

Table 5. Demographic profile of respondents

Measure	Item	Frequency	(%)
Gender	Male	82	85%
	Female	14	15%
Age	20-29 years old	21	22%
	30-39 years old	46	48%
	40-49 years old	25	26%
	> 50 years old	4	4%
Job Position	Manager	33	34%
	IT Professional	63	66%
Education	Diploma	18	19%
	Bachelor	56	58%
	Master	22	23%
Working Period	< 1 year	16	17%
	1-3 years	14	14%
	3-5 years	22	23%
	> 5 years	44	46%

The hypothesis test results indicate that the p -value of the relationship between variables is <0.05 , except for the relationship between technology and the effectiveness of e-procurement implementation ($p=0.915$) and the relationship between the environment and the effectiveness of e-procurement implementation ($p=0.122$).

Based on table 5, it can be concluded that the relationship between strategy and the effectiveness of e-procurement implementation is 0.048 ($p<0.05$), organization and the effectiveness of e-procurement implementation is 0.030 ($p<0.05$), people and the effectiveness of e-procurement implementation is 0.006 ($p<0.05$). Furthermore, the relationship between the effectiveness of e-procurement implementation and accountability, transparency, efficiency is 0.000 ($p<0.05$).

The association between strategy and clear objectives with the effectiveness of e-

procurement implementation is 0.231 ($p=0.048$); thus, the hypothesis 1 is supported. The strategy and objectives of e-procurement must be devised appropriately so that e-government can be carried out sustainably. This is due to since 2003, the government has issued some e-government policies, but year by year, the global rank of e-government readiness as well as the regional rank of Indonesia still in low rank (Ali Rokhman, 2011).

The procurement of goods/services is conducted as effectively as possible to account for public funds. Therefore, the government needs to devise a clear strategy and objectives so that the implementation of e-procurement in government organizations can run effectively. This finding is consistent with the research of Choi et al., (2016), who found that the right and consistent objectives and strategies play an essential role in the successful implementation of e-procurement.

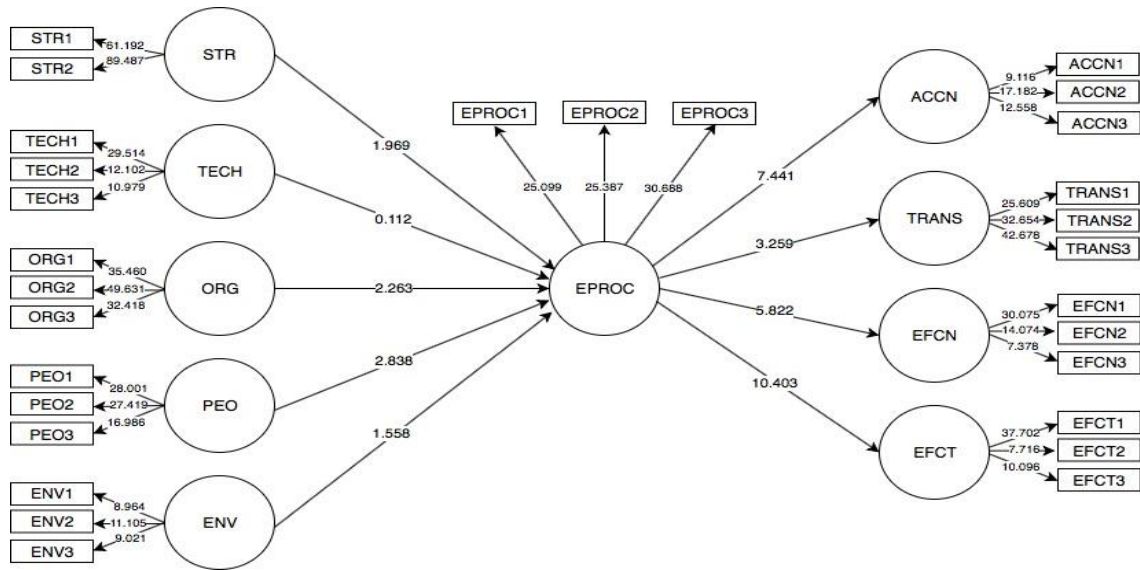


Figure 2. Evaluation of structural model

The strategy and objectives of the procurement of goods/services in Indonesia devised by the local government have been stated in Presidential Regulation No. 16 (2018). It is stated that the objectives of government goods/services procurement are to produce the right goods/services from every money spent, measured from the aspect of quality, amount, time, cost, location, and provider.

The regulation also encourages to increase the use of domestic products, the participation of micro business, small business and medium business, the role of national business actors, creative industry participation; to support the implementation of research and utilization of

goods/services from research results; to encourage economic equality and sustainable procurement.

The association between technology readiness with the effectiveness of e-procurement implementation is -0.013 ($p=0.915$); thus, the hypothesis 2 is not supported. Technology readiness that has no significant effect can be caused by technological infrastructure factors in local government organizations that have not been able to support the e-procurement.

Mcivor et al., (2002) explained that one of the main problems faced by many organizations is the organizational structure, and the role of the people in it cannot adapt to new technology.

Tabel 6. Path coefficients

Hypothesis		Coefficient	Standard error	t-value	p-value	Results
H1	STR → EPROC	0.231	0.124	1.969	0.048	Supported
H2	TECH → EPROC	-0.013	0.126	0.112	0.915	Not Supported
H3	ORG → EPROC	0.281	0.130	2.263	0.030	Supported
H4	PEO → EPROC	0.340	0.124	2.838	0.006	Supported
H5	ENV → EPROC	0.163	0.105	1.558	0.122	Not Supported
H6	EPROC → ACCN	0.651	0.088	7.441	0.000	Supported
H7	EPROC → TRANS	0.416	0.131	3.259	0.000	Supported
H8	EPROC → EFCN	0.591	0.102	5.822	0.000	Supported
H9	EPROC → EFCT	0.742	0.072	10.403	0.000	Supported

The association between organization and system with the effectiveness of e-procurement implementation is 0.281 ($p=0.030$); thus, the hypothesis 3 is supported. The organization integrates with the system so that the implementation of e-procurement runs effectively. Local governments in Indonesia are proper enough to integrate with the system following Presidential Regulation No. 16 the Year 2018, which states that government procurement of goods/services is conducted using information and communication technology, as well as electronic transactions.

The association between human resource assistance with the effectiveness of e-procurement implementation is 0.340 ($p=0.006$); thus, the hypothesis 4 is supported. Consistent with Bakry (2004) that every party involved in e-government requires learning and training.

Hermana & Silfianti (2011) stated that to achieve the cultural and organizational change which is necessary for the benefits of e-government to be fully realized, resources need to be made available for educating both staff and citizens in the concepts of e-government. One of the determinants of the success of an innovation is human resources. If human resources involved in innovation have sufficient competence, innovation will succeed. Meanwhile, the association between the institutional environment with the effectiveness of e-procurement implementation is 0.163 ($p=0.122$); thus, the hypothesis 5 is not supported.

The associations between the effectiveness of e-procurement implementation with accountability, transparency, efficiency, and effectiveness are 0.651, 0.416, 0.591, and 0.742 ($p=0.000$). This shows that the hypotheses 6, 7, 8, and 9 are supported. The principle of optimal public procurement is transparent and fair competition, minimizing transaction costs, and equal opportunities for all providers (Pashev, 2011). These results indicate that the government has succeeded in applying the principle of

procurement of goods/services as stipulated in Presidential Regulation No. 16 the Year 2018, that the procurement of goods/services must apply the principles: efficient, effective, transparent, overt, competitive, fair/not discriminatory, and accountable. Based on T-Statistics, it can be concluded that the government has been responsible for the implementation of e-procurement. The government is responsible for the implementation of e-procurement by ensuring the easy operation of the e-procurement process, which can be demonstrated by the easy process of auction announcement until the signing of the contract.

The supported hypotheses 7, 8, and 9 are in line with Rotchanakitumnuai (2013) that provides evidence that the e-procurement process has a positive impact on cost-effectiveness, transparency, and accountability. Electronic mode of public procurement enables governments and organizations to achieve efficient and effective, transparency, and fairness in the tendering process (Frimpong, Andoh-baidoo, & Asamoah, 2020).

Also, the results support the findings of Costa et al., (2013) that the implementation of e-procurement can improve the transparency process. One of the benefits of e-procurement is increasing the transparency of the government shown in the implementation process. When the auction process is carried out, society can access this information without exception from the website provided by the government. The auction process can be followed by everyone, even though they are outside the area that holds an auction. This is government transparency in e-procurement activities.

The findings are also consistent with Gebauer & Shaw (2004) who found that e-procurement has an operational impact on process efficiency. When government procurement of goods/services is still done manually, providers must come to the local government to see auction announcements and

prepare documents in physical form. In contrast, when done electronically, service providers only need to access auction announcements through websites and upload documents to applications provided by the government.

All research findings show that a clear strategy and objectives, integration between organizations and systems, and human resource assistance have a positive effect on the effectiveness of implementing e-procurement in improving accountability, transparency, efficiency, and effectiveness of the government. The findings indicate that all factors have an association with the effectiveness of the implementation of e-procurement except the readiness of technology and the institutional environment. This due to technological infrastructure factors in local government organizations that have not been able to support e-procurement.

The technological infrastructure factor that has not supported this can be due to several problems such as lack of budget allocation for ICT (Information and Communication Technology), lack of awareness and training on systems for human resource, and lack of awareness of the parties involved who still think about personal interests. Accordingly, Indonesian local government needs to allocate a budget that is sufficient to increase ICT use in the procurement of goods/services, train LPSE, and ULP staff, and, most importantly, increase awareness so that each authorized official is not involved in actions that can harm society.

In addition to the website of e-procurement (LPSE), governments should strive to enhance the quality of e-government websites by improving service convenience and minimizing performance failure (Seo et al., 2018). In the environmental context, Choi et al., (2016) found that environmental factors are critical because the environment in which the e-procurement system is implemented has not been adequately prepared or missed from expectations, especially in

institutional matters. Therefore, the institutional environment cannot support the effective implementation of e-procurement. E-government is an important area of policy development and indeed has the potential to change how the public sector operated, both internally and concerning its customers (Hermana & Silfianti, 2011). Regulations need to be well established to ensure the successful implementation of new systems, especially in developing countries such as Indonesia.

5. Conclusions

This study provides the view that clear strategies and objectives, integration between organizations and systems, and human resource assistance can improve local government accountability, transparency, efficiency, and effectiveness in conducting procurement activities for goods/services through effective e-procurement implementation. E-procurement does provide many benefits for the government and the public as a means to prove the government's accountability and transparency behavior to the public. With this proof, public trust in the government will be even higher, and the government will be increasingly motivated to improve its performance.

The results of this study may encourage further the creation of good governance. For the public who act as providers, the benefits of e-procurement are shown by cost and time efficiency. Thus, e-procurement is proven to help in achieving the main objectives of government organizations, which is improving services to the public. This study also contributes to the literature on the effect of the Strategy, Technology, Organization, People, and Environment (STOPE) variables on e-government, which until now has not been widely studied in Indonesia.

This research provides a trigger for the Indonesian local governments to develop and implement better e-procurement. It provides an

understanding of the factors that influence the effectiveness of implementing e-procurement in government organizations. These factors include clear strategies and objectives, integration between the organization and system, and human resource assistance.

The government needs to increase these factors in government organizations so that e-procurement by the government can be more effective. Also, this study provides evidence that effective e-procurement activities can improve the accountability, transparency, efficiency, and effectiveness of the government.

To ensure accountable, transparent, efficient, and effective e-procurement activities, the central government needs to coordinate with each local government so that these benefits can be continuously obtained. The synergy between the central government and local governments, the effective response of local governments to the central government, and reinforcement of local capacity and willingness to fight corruption and carry out e-procurement programs are essential factors for successful e-procurement implementation (Nurmandi & Kim, 2015).

Finally, like any other research, this study is not without limitations. It has limited number of samples due to the large number of samples that do not respond to filling out the questionnaire. Many local government on LPSE websites in Indonesia do not include e-mail addresses, hence we found it challenging to distribute questionnaires, especially in the areas in eastern Indonesia. Further research can increase the number of research samples to obtain a higher response rate and expand this research by adding other variables in addition to the STOPE variables.

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