Technology Acceptance Model on E-Procurement Toward Indonesia's Procurement Governance

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Abstrak. Electronic procurement (e-procurement) has been widely adopted as a public sector reform to improve procurement governance, particularly in developing countries. In Indonesia, e-procurement has been implemented nationally through the Layanan Pengadaan Secara Elektronik (LPSE); however, empirical evidence on its governance impact remains limited. This study examines the effect of e-procurement implementation on procurement governance in Indonesia's government using the Technology Acceptance Model (TAM). E-procurement implementation is measured by perceived usefulness and perceived ease of use, while procurement governance is operationalized as a multidimensional construct encompassing transparency, accountability, efficiency, effectiveness, fairness, competitiveness, monitoring, capacity, and accessibility as stated in Presidential Regulation. Primary data were collected from 327 respondents of Indonesian government officials involved in e-procurement implementation and analyzed using Structural Equation Modeling with Partial Least Squares (SEM-PLS). The findings show that e-procurement implementation has a positive and significant effect on procurement governance, indicating that higher acceptance of the system contributes to improved governance quality. This study contributes to the literature by integrating technology acceptance theory with public procurement governance and provides empirical evidence from a developing-country context to inform policy and practice.

Keywords: e-procurement; governance; TAM; government.

INTRODUCTION

Electronic procurement (e-procurement) has become a central instrument of public sector reform, particularly in developing countries where procurement processes are often vulnerable to inefficiency and corruption. In Indonesia, e-procurement has been implemented nationally through Layanan Pengadaan Secara Elektronik (LPSE) as part of a broader agenda to improve governance in government procurement.

The reform is expected to strengthen the principles of good procurement governance, which include transparency, accountability, efficiency, effectiveness, fairness, competitiveness, monitoring, capacity, and accessibility. However, despite widespread implementation across ministries, local governments, and public institutions, evidence on the effectiveness of e-procurement in enhancing procurement governance remains inconsistent. Some government entities report increased efficiency and transparency, while others continue to face issues of limited accountability, unequal access, and procedural irregularities.

This discrepancy raises critical research problems. First, does the implementation of e-procurement significantly improve procurement governance in Indonesia's public sector. Second, how do users' perceptions of the system's usefulness and ease of use—key constructs of the Technology Acceptance Model (TAM)—affect the quality of procurement governance. Third, to what extent does the current e-procurement system contribute to achieving the intended governance principles, such as transparency, fairness, and efficiency, across government institutions. These questions highlight the need for a more systematic and empirical examination of the relationship between e-procurement implementation and procurement governance outcomes.

The significance of this research lies in addressing a persistent gap between technological adoption and governance performance. While e-procurement systems have been widely deployed, their actual contribution to improving governance has not been sufficiently demonstrated through empirical data. This study integrates the Technology Acceptance Model (TAM) with procurement governance theory to explain how perceived usefulness and perceived ease of use influence the effectiveness of governance in the public procurement process.

TAM Davis (1989) provides the theoretical foundation for understanding user behavior and technology acceptance, while institutional and agency theories help explain how e-procurement reduces information asymmetry, strengthens monitoring, and aligns the interests between public officials (agents) and citizens (principals). Prior studies have shown that technology acceptance influences adoption (Odi & Suryani, 2020; Susantya et al., 2022), but few have linked it directly to governance outcomes such as accountability or transparency (Khorana, 2024; Masudin et al., 2021).

This study is theoretically grounded in three perspectives. The Technology Acceptance Model (TAM) (Davis, 1989) underpins the e-procurement variable, measuring two critical constructs: perceived usefulness (the extent to which users believe e-procurement enhances their performance) and perceived ease of use (the degree to which they believe the system is free of effort).

Research results Jones (2017) confirm the relationship between TAM and e-procurement. This study found that the quality dimensions of e-procurement impact individual employees' levels of acceptance of e-procurement. A research review Nandankar (2020) concluded that nearly all researchers using the Technology Acceptance Model framework indicated that perceived ease of use and usefulness are important drivers of e-procurement adoption, use, and performance. These perceptions influence how effectively e-procurement is used, thereby shaping governance outcomes.

The acceptance of users influences the success of a system's implementation. This is because individual perspectives are influenced by the attitudes or behaviors of system users, resulting in perceived usefulness and benefits from the system's implementation, which aligns with the Technology Acceptance Model (Strawderman, 2022). Prior studies support this integration: Vaidya et al. (2016) emphasize e-procurement's role in transparency; Mahadevan (2021) identifies institutional challenges to reform; and Handayani et al. (2022) confirm the relevance of TAM in Indonesia's public sector digital adoption.

Although electronic procurement (e-procurement) has been widely promoted as a tool to enhance public sector governance, a critical review of the literature reveals several important research gaps that justify this study. Previous research has often examined e-procurement primarily through the lens of technology adoption rather than its governance outcomes. Studies such as Odi and Suryani (2020) and Susantya et al. (2022) employ the Technology Acceptance Model (TAM) to analyze user intention and behavioral acceptance, focusing on perceived usefulness and perceived ease of use.

However, these studies tend to stop short of evaluating how user acceptance translates into broader procurement governance improvements such as transparency, accountability, efficiency, or fairness. In Indonesian government, the principles of public procurement of goods and service stated in Presidential Regulation Number 46/2025 that are transparency,

accountability, effectiveness, efficiency, fairness, openness, and competitiveness. This indicates a theoretical gap between individual-level acceptance and institutional-level governance outcomes, which this study seeks to bridge by integrating TAM with procurement governance theory.

In addition, many prior works have narrowly focused on single dimensions, such as transparency (Khorana, 2024) or efficiency (Mahadevan, 2021), rather than treating governance as a multidimensional construct encompassing transparency, accountability, effectiveness, efficiency, fairness, competitiveness, monitoring, capacity, and accessibility. This research addresses this conceptual gap by developing and empirically testing a multidimensional measurement of procurement governance that reflects the holistic principles adopted in Indonesia's public procurement.

Empirically, although Indonesia has been recognized for implementing the Layanan Pengadaan Secara Elektronik (LPSE) system, few studies have collected primary data from Indonesian government agencies. Much of the existing evidence is either descriptive or regression-based analyses (Wicaksono et al., 2017;Choi et al., 2016; Masudin et al., 2021) which limits contextual applicability. This study contributes to filling the empirical and contextual gap by using primary survey data from government officials in Indonesia who actively use e-procurement systems.

The use of SEM-PLS enhances the robustness of the analysis and allows for a more comprehensive understanding of the direct causal effects between e-procurement and governance constructs. Therefore, this study integrates TAM constructs with multidimensional procurement governance indicators in the Indonesian LPSE context using SEM-PLS. Practically, the findings offer support for continuing and strengthening digital procurement reforms as means to enhance transparency, accountability, efficiency and fairness in public procurement for policymakers and procurement authorities in Indonesia. Accordingly, the study develops the following single hypothesis: H1 : The implementation of e-procurement has a positive effect on procurement governance in Indonesian government.

MATERIALS AND METHODS

The population and unit of analysis for this study are all Indonesian ministries, government institutions, provincial governments. The respondent's contact data was obtained from the National Public Procurement Agency (LKPP) website. The government respondents are procurement officers from the procurement unit. All potential respondents are filtered based on their qualifications as procurement actors with more than one year of experience in the procurement position.

This research employed primary data and received Informed Consent from the respondents and Ethical Approval from the Research Ethics Committee of the University of Indonesia. The questionnaire used Likert Scale from 1 very disagree to 5 very agree. The study received Informed Consent for Participation from the respondents and Ethical Approval from the Research Ethics Committee of the University of Indonesia.

The questionnaires are analyzed using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) software. There are two models in SEM PLS: the Measurement Model (Outer Model) and the Structural Model (Inner Model). The research model is a higher-order

construct (HOC). E-procurement is measured by two lower-order constructs (LOC): Ease of use and Usefulness. The governance construct is also a higher-order construct.

It is measured by 14 lower-order constructs: Transparency, Accountability, Effectiveness, Efficiency, Openness, Competitiveness, Fairness, Integrity, Monitoring, Accessibility, Capacity, Participation, Integration, and Risk Management. Outer Model Evaluation involves assessing the measurement model to ensure the validity and reliability of the variables. This evaluation is conducted at the LOC or HOC level. Higher-order construct model estimation can use the Disjoint Two-Stage Approach (Sarstedt et al., 2019), which is the most recommended method (Becker et al., 2023).

Measures of outer model evaluation include: Indicator Reliability (Outer Loadings) > 0.70, Internal Consistency Reliability (Cronbach's Alpha), Composite Reliability (CR) > 0.70, Convergent Validity > 0.50 (more than 50% of the indicator's variance is explained by the construct), and Discriminant Validity using the Fornell-Lacker criterion, where the root of the AVE > correlation (Hair et al., 2021).

Inner Model Evaluation includes Path Coefficient Significance, which is assessed by the p-value or t-statistic from the bootstrapping procedure. If the p-value is less than 0.05, or the t-statistic is greater than 1.96 at a 95% confidence level, the relationship is significant. The Coefficient of Determination, or R square (R^2), has standards: 0.25 is weak, 0.50 is moderate, and 0.75 is strong. The effect size f-square measures the influence of the exogenous variable at the structural level. Criteria for effect size f-square values are 0.02 (small), 0.15 (moderate), and 0.35 (large). Predictive Relevance is assessed by Q^2 predict. If the Q^2 predicted value is greater than zero, the model has relevant predictive ability. SRMR (standardized root mean square residual) measures model fit by comparing the model correlation matrix with estimates. An SRMR <0.08 indicates a fit model (Hair et al., 2021).

RESULTS AND DISCUSSION

Of the 327 respondents, 106 people (32.4%) come from government ministries, 113 people (34.6%) from provincial governments, and 108 people (33%) from government institutions. The profiles or positions of respondents are provider selection working groups (34.6%), procurement officers (24.8%), authorized budget users (2.4%), commitment-making officers (13.8%) and other positions (24.5%).

**Table 1. Descriptive Statistics and Outer Model Evaluation**

Dimension/ Variable	Mean	Std Deviation	# Indicator	Outer Loading	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
Lower Order Construct (LOC)							
GU	4,358	0,720	3	0,840 - 0,909	0.859	0.914	0.779
MU	4,338	0,737	3	0,878 - 0,905	0.849	0.909	0.769
ADI	3,956	0,907	2	0,890 - 0,907	0.761	0.893	0.807
AKS	3,922	0,930	2	0,899 - 0,905	0.771	0.897	0.814
AKU	4,271	0,822	2	0,923 - 0,942	0.850	0.930	0.869
BUK	4,213	0,826	2	0,939 - 0,946	0.874	0.941	0.888

Dimension/ Variable	Mean	Std Deviation	# Indicator	Outer Loading	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
EFE	4,020	0,849	2	0,925 - 0,933	0.842	0.927	0.863
EFI	4,069	0,834	2	0,922 - 0,933	0.838	0.925	0.860
GRAS	4,018	0,873	2	0,938 - 0,951	0.880	0.943	0.892
GRIT	4,300	0,840	2	0,877 - 0,912	0.751	0.889	0.800
KAP	4,208	0,817	2	0,938 - 0,948	0.876	0.941	0.889
MON	3,966	0,890	2	0,934 - 0,943	0.865	0.937	0.881
PAR	4,072	0,864	3	0,863 - 0,960	0.855	0.911	0.774
RES	3,927	0,881	2	0,957 - 0,960	0.912	0.958	0.919
SAI	3,833	0,925	2	0,845 - 0,924	0.731	0.878	0.784
TRA	4,265	0,792	2	0,919 - 0,932	0.833	0.923	0.857
Higher Order Construct (HOC)							
e-Procurement	4,348	0,728	2	0,949 - 0,955	0.896	0.951	0.906
Governance	4,074	0,861	14	0,787 - 0,890	0.967	0.971	0.703

Source: Author

Descriptive statistics show an average score of 4.348 for e-procurement and 4.074 for governance, indicating relatively high scores. These results indicate relatively good implementation of e-procurement and governance. Likewise, the mean score for each dimension is also relatively high. Furthermore, the SEM PLS estimation results, using the disjoint two-stage approach, begin with an evaluation of the lower-order construct (LOC) or dimension, or the first stage. The first stage, which examines the causality between each LOC and its indicators, shows that all indicators validly measure their respective LOC or measurement dimensions, with outer loadings >0.70.

Furthermore, reliability (internal consistency) is measured using Cronbach's Alpha and Composite Reliability, indicating the extent to which the questionnaire items consistently measure the same LOC or dimension. The first stage of estimation shows Cronbach's Alpha and Composite Reliability values above 0.70 (reliable). Likewise, AVE is a measure of convergent validity, with an estimated AVE value above 0.50. Thus, all measurement dimensions have acceptable discriminant validity. After the first stage of the PLS SEM evaluation is completed, latent variable scores (LVS) are created for the dimensions, which then serve as scores or input for the second stage of the PLS SEM estimation (Sarstedt et al., 2019).
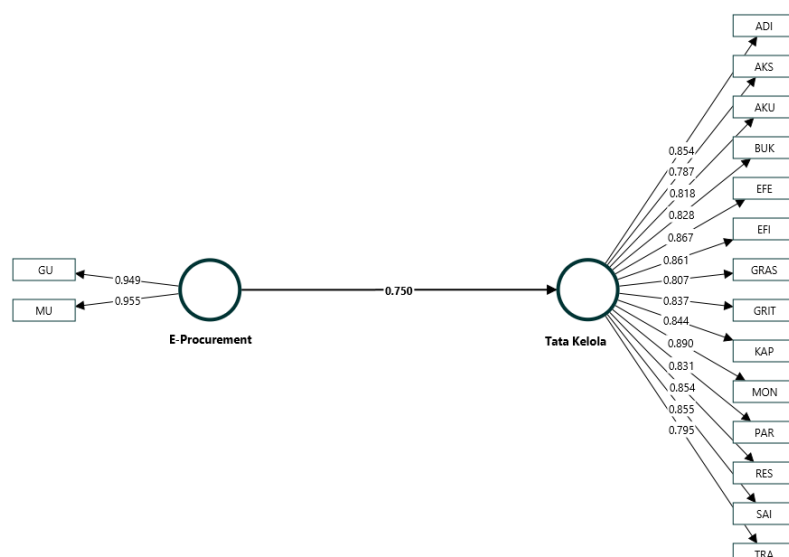
Figure 1. Second Stage PLS SEM Estimation
Source: Author

The second-stage PLS model estimation, namely the causality between constructs and their dimensions, shows an outer loading of the usefulness dimension of 0.949 and ease of use of 0.955. These results indicate that ease of use and usefulness are highly correlated in reflecting e-procurement measurements. This aligns with previous research, which states that the benefits of e-procurement can be seen in addressing procurement tasks, improving the work environment within the procurement process within the organization, and completing procurement tasks more quickly than manual systems (Neupane S., 2012). A research review (Nandankar, 2020) concluded that perceived ease of use and usefulness are important drivers of e-procurement adoption, usage, and performance. Thus, perceived usefulness and ease of use impact attitudes toward IT system use.

Meanwhile, the outer loading of LOC or the dimension that measures governance lies between 0.787 – 0.890. The dimensions with the highest outer loading are the Monitoring dimension (0.890), Effectiveness (0.867), and Efficiency (0.861). According to the presidential regulation (LKPP, 2018), the principle of efficiency in government procurement of goods and services is demonstrated by optimizing government resources and implementing procurement in accordance with procurement methods, costs, schedules, and contracts.

The LKPP regulation also states that monitoring and control are carried out through review and whistleblowing. Furthermore, the national anti-corruption strategy emphasizes the importance of implementing internal controls, evaluation, and audits of government procurement. Meanwhile, the lowest outer loading, although valid, is the Accessibility dimension (0.787) and Transparency (0.795). According to previous studies, the principles of transparency, accountability, participation, integrity, and accessibility (OECD, 2016; Gardenal, 2013; Khorana, 2015) are governance principles that must be applied in public procurement.

The Cronbach's alpha and Composite Reliability generated for the e-procurement construct are (0.896) and (0.951), respectively, while for the governance construct are (0.967) and (0.971). The internal consistency of the dimensions in measuring each construct is at a high level of reliability. The construct-level convergent validity values are indicated by the AVE

(average value) for e-procurement which is 0.906 and for governance which is 0.703.

Both results are above 0.50, indicating acceptable convergent validity. Discriminant validity indicates that a construct or dimension is distinct from other constructs or dimensions and is empirically tested. The evaluation results indicate that all constructs or measurement dimensions have an AVE greater than their correlation. Overall, discriminant validity is accepted (Sarstedt et al., 2019).

Table.2 Hypothesis Result

Hypothesis		Path Coefficient	T Statistics	P values	F Square	R square	Q²predict	SRMR
E-Procurement Governance	->	0.750	19.072	0.000	1.283	0.562	0.561	0,043

Source: Author

The results of the hypothesis testing show a significant effect of e-procurement on governance with a path coefficient of 0.750 and a p-value <0.05. This result proves and agrees with Basheka B. (2013), stating that a rigorous electronic procurement process has a positive impact on the implementation of good governance by optimizing cost-effectiveness and transparency. The use of e-procurement not only improves efficiency by increasing competition and reducing administrative burdens, but can also increase transparency by making public authorities more accountable (OECD, 2015).

Research by Bromberg & Manoharan (2015) states that the benefits of e-procurement are similar to those of e-government in general, namely, increasing transparency and efficiency. More specifically, e-procurement measurement is related to transparency, which addresses issues of fairness and competition in procurement bidding (Chomchaiya, 2016).

The R-square value is 0.562, indicating a medium effect. The F-square measure is 1.283. The Q-square predictor is 0.561 > 0.50, indicating high predictive relevance. Meanwhile, the SRMR value is 0.043 <0.08, indicating acceptable model fit. These results indicate that the goodness of fit of the SEM PLS model of the effect of e-procurement on governance can be explained by empirical data.

Table 3. PLS Multigroup Analysis

		Group			
		Path Coefficient 1	Path Coefficient 2	Difference Path coefficient	P-value
E-Procurement Governance	->	0.713	0.807	-0,095	0.100

Source: Author

PLS Multigroup analysis is a follow-up analysis after hypothesis testing that is useful for determining whether there is heterogeneity in the research sample. Government respondents are divided into two groups. The first is the central government, which consists of ministries and institutions. The second group is the provincial or regional governments. The test results prove that the path coefficient of the influence of e-procurement on governance in group 1 is 0.713, slightly lower than the second group with a path coefficient of 0.807. However, the

difference in the path coefficient is not significant with a p-value of 0.100 > 0.05. This means that the influence of e-procurement on governance is relatively the same between central and regional government respondents.

The finding proves that enhancing perceived usefulness and ease of use can increase effective system utilization, which in turn improves governance outcomes. Government institutions should prioritize system usability and functional relevance to procurement tasks. The e-procurement initiatives can strengthen user's acceptance and maximize governance benefits for Indonesia's government.

The findings suggest that regulators should adopt user's approach when upgrading e-procurement system. Features that improve accessibility, information clarity, and monitoring capabilities can enhance governance outcomes for continuous improvement. Improved governance through e-procurement may contribute to reducing risks and fraud in procurement processes. Policymakers can leverage these findings to strengthen internal controls and audit mechanisms embedded within e-procurement systems.

CONCLUSIONS

The results answer the research questions. First, the implementation of e-procurement significantly improves procurement governance in Indonesia's public sector. Second, the users' perceptions of the system's usefulness and ease of use as key constructs of the Technology Acceptance Model (TAM), affect the procurement governance principles, such as monitoring, effectiveness and efficiency across government institutions. In summary, this research makes contribution theoretically, as it advances the understanding of e-procurement by integrating TAM and procurement governance principles.

This study gives practical implementation to the government to better implement transparency and accessibility in procurement governance. For future studies, this research recommends sample size that is more proportional to the number of procurement officials and the use of more indicators. The practical insights are also applicable to other developing countries implementing e-procurement. The emphasis on technology acceptance implies how digital procurement reforms can be aligned with governance objectives in similar institutional environments.

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