The Impact of E-Procurement Maturity and Sustainable Procurement on Procurement Performance in the Public Sector: A Case Study at the Open University

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ABSTRACT Public procurement plays a strategic role in improving efficiency, transparency, and accountability in public sector organizations. Along with digital transformation, public institutions are increasingly adopting e-procurement and sustainable procurement to improve procurement performance. However, empirical studies that simultaneously examine the influence of e-procurement maturity and sustainable procurement on procurement performance, particularly in higher education institutions, are still limited. This study aims to analyze the impact of e-procurement maturity and sustainable procurement on procurement performance, measured through the dimensions of cost, time, quality, and service.

This study employs a quantitative explanatory approach using Structural Equation Modeling–Partial Least Squares (SEM-PLS). Data were collected through a structured questionnaire from 52 procurement practitioners at a public higher education institution in Indonesia. E-procurement maturity was measured using multidimensional system and process indicators, while sustainable procurement was represented by green procurement and procurement innovation indicators.

The results show that e-procurement maturity has a positive and significant impact on all procurement performance dimensions, with the strongest impact on time and cost performance. In contrast, sustainable procurement does not have a statistically significant impact on any performance dimension, indicating that sustainability practices are still in the early stages of maturity and have not been substantially integrated into core procurement processes. These findings highlight the importance of prioritizing digital procurement maturity while gradually strengthening sustainability implementation to improve public procurement performance.

Keywords: e-procurement maturity, sustainable procurement, procurement performance, SEM-PLS

I. INTRODUCTION

Procurement of goods and services is one of the strategic functions in the governance of public organizations, so the implementation of e-procurement is necessary. E-procurement is used as a socio-technical effort, interaction between the public and private sectors (Mohungoo et al, 2020), enabling a public institution to automate and simplify the procurement process and integrate information for better results (Pitso, et al, 2018). E-procurement provides transparency, process efficiency, and standardization of procedures that ultimately improve procurement performance. According to Kasmono et al (2025), the holistic implementation of *e-procurement* can balance the relationship between technology and humans, which is one of the important factors in the level of procurement governance maturity.

However, digitalization alone is not enough. Global and national pressure to achieve sustainable development is pushing the public sector to integrate sustainable procurement principles into procurement processes. Organizations such as the OECD, WTO, and World Bank emphasize that

sustainability is part of good governance and is a crucial element for creating long-term efficiency, reducing emissions, a circular economy, and improving supply chain health (OECD, 2022). Sustainable procurement includes selecting environmentally friendly products, evaluating social impacts, improving product quality for longer durability, and innovating resource utilization (Appolloni et al., 2014; Benchekroun et al., 2024).
In higher education institutions, especially in developing countries, sustainability implementation still faces various obstacles, including a lack of green specification standards, low availability of vendors that meet environmental standards, minimal internal policies, and the absence of clear sustainability performance indicators (Bhandari et al., 2025). Consequently, sustainability practices are often administrative or symbolic in nature and have not significantly impacted procurement performance. The combined impact of e-procurement and sustainability on procurement performance needs to be measured to achieve effectiveness and efficiency in goods/services procurement.

This research fills a gap in research by simultaneously examining e-procurement and sustainable procurement variables within a single structural model, thus positioning sustainability as a conceptual variable. This research aims to identify the relationships between e-procurement and sustainable procurement indicators relevant to the procurement context in higher education institutions.

II. THEORICICAL BACKHRUND

e-procurement

E-procurement implementation has successfully improved procurement performance (Wright, RJ, Shiner JM, 2017), but the adoption of *e-procurement* also creates new risks (Andaru et al., 2024). Furthermore, stakeholder resistance to new processes and technologies (Mohungoo, et al., 2020) also poses a risk in *e-procurement* . As organizations mature, they increasingly utilize information systems for automation, data analysis, transparency, and integration with digital ecosystems (Tran & Luo, 2025).

Sustainability

Sustainable procurement is the integration of environmental, social, and economic dimensions into the procurement process (OECD, 2022; Appolloni et al., 2014). However, in developing countries, implementation remains low, indicators are not well-established, and the impact on performance is often insignificant.

Procurement Performance

Procurement performance, among other things, contributes to the acquisition of quality goods and services, thus providing excellent service (Barsemoni et al., 2014). Musa et al. (2023) show that effective *e-procurement implementation* can reduce transaction costs, minimize corruption, and increase transparency in public spending, thus directly impacting cost performance.
Conceptual Model

The conceptual model in this study describes the relationship between elements that influence procurement performance.

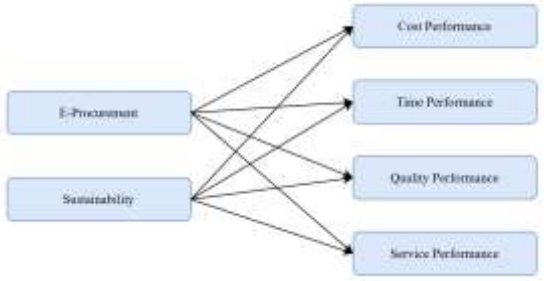

Figure 1. model of relationships

This conceptual model places *E*-Procurement and Sustainability as two main variables that directly influence the four dimensions of procurement performance, namely cost, time, quality, and service.

Hypothesis

From the existing conceptual model, there is a relationship between each variable formulated in the form of a hypothesis (Sugiyono, 2017). In this study, there are six variables formulated to test the relationship between the variables in the model. Each hypothesis describes a potential relationship that is tested to determine the extent of each independent variable's contribution to the dependent variable.

1. Relationship between E-Procurement and Cost Performance (H1)

Procurement digitalization has been proven to reduce transaction costs, increase budget transparency, and reduce operational costs in public organizations (Spacek et al., 2023), so the higher the level of e-procurement implementation, the greater the cost efficiency achieved (Dudić et al., 2024).
H1: e-Procurement has a positive and significant effect on cost performance.

2. The Relationship between E-Procurement and Quality Performance (H2)

The integration of e-procurement systems improves the accuracy of specifications, document consistency, and quality control, so that the quality of goods/services tends to increase (Rejeb et al., 2024), so that the better the implementation of e-procurement, the higher the quality of procurement results (Gurgun et al., 2024).
H2: e-Procurement has a positive and significant effect on quality performance.

3. Relationship between E-Procurement and Service Performance (H3)

Effective implementation of e-procurement has strong potential to improve the overall quality of procurement services (Spacek et al., 2023).
H3: e-Procurement has a positive and significant effect on service performance.

4. Relationship between E-Procurement and Time Performance (H4)

The implementation of e-procurement allows for the acceleration of tender cycles, reduction of bottlenecks, and increased timeliness in project completion (Oniyangi et al., 2024), so that more mature adoption of e-procurement will significantly improve procurement time performance (Dudić et al., 2024).
H4: e-Procurement has a positive and significant effect on time performance.

5. Relationship between Sustainability and Cost Performance (H5)

Sustainable procurement has the potential to reduce long-term costs through energy efficiency, waste reduction, and lifecycle costing optimization (Benchekroun et al., 2024), so the stronger the sustainability orientation in procurement, the greater the cost efficiency achieved (Bhandari et al., 2025).
H5: Sustainability has a positive and significant effect on cost performance.

6. Relationship between Sustainability and Quality Performance (H6)

Sustainability practices encourage the use of environmentally friendly and high-quality products that have a longer lifespan (Rejeb et al., 2024) so that the greater the commitment to sustainability, the higher the quality of goods/services produced in the public procurement process (Appolloni et al., 2024).
H6: Sustainability has a positive and significant effect on Quality Performance

7. Relationship between Sustainability and Service Performance (H7)

Vendors that implement sustainability principles tend to have stable and professional operational processes, thereby improving services to public institutions (Benchekroun et al., 2024).
H7: Sustainability has a positive and significant effect on Service Performance

8. Relationship between Sustainability and Time Performance (H8)

Sustainability procurement that emphasizes supply chain stability and the selection of responsible suppliers can reduce the potential for delivery delays (Rejeb et al., 2024).
H8: Sustainability has a positive and significant effect on Time Performance

III. METHOD

This study uses a quantitative approach with an explanatory research design to analyze the relationship model between e-procurement and sustainability variables on procurement performance.

Sample

The research sample consisted of procurement actors at the Open University, with a total of 52 respondents obtained through purposive sampling techniques.

Data collection

Prior to distribution, 28 instruments were validated by five procurement experts. The expert validation process involved two main stages: *content validity* and *construct validity*. Next, a pilot survey was conducted to ensure the questionnaire was easy to understand and aligned with the research objectives. The pilot survey involved ten respondents in the procurement of goods/services sector.

Data analysis

Second, a statistical analysis was conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS) through SmartPLS 4 software. The SEM-PLS method was chosen because it is very suitable for use in research with small sample sizes (<200 respondents), predictive models, and reflective indicators, as are the characteristics of this study. The analysis was conducted in two stages:

(1) testing the measurement model (outer model) includes tests of convergent validity, discriminant validity, and construct reliability;

(2) testing the structural model (inner model) through analysis of path coefficients, R^2, Q^2 values, and statistical significance based on bootstrapping.

The model results are used to answer research questions and test hypotheses on the relationship model between e-procurement and sustainability variables on procurement performance.

Instrument Development and Measurement

Based on the literature review and expert validation, the dimensions and indicators that represent the variables total 28 indicators, as follows:

Table 3. Research Variables, Dimensions and Indicators

Code	Variables and Indicators	Code	Variables and Indicators
X1	**Information System (11 indicators)**	**Y1**	**Cost Performance (4 indicators)**
X1.1	E-Procurement	Y1.1	Cost requirement planning
X1.2	System integration	Y1.2	Cost efficiency
X1.3	E-signature	Y1.3	Budget realization compliance
X1.4	Digital footprint	Y1.4	Price negotiation
X1.5	Data analytics	**Y2**	**Time Performance (4 indicators)**
X1.6	system quality	Y2.1	Timeliness of the procurement process
X1.7	information quality	Y2.2	Timeliness of contract execution
X1.8	quality of service	Y2.3	Response to urgent needs
X1.9	system benefits	**Y3**	**Quality Performance (3 indicators)**
X1.10	*Satisfied and intend to use*	Y3.1	Conformity to specifications and quality
X1.11	Website	Y3.2	Free from quality defects
X2	**Sustainable (2 indicators)**	Y3.3	Satisfaction with procurement quality
X2.1	*Green procurement*	**Y4**	**Service Performance (5 indicators)**
X2.2	Procurement innovation	Y4.1	User satisfaction
		Y4.2	Professionalism in service
		Y4.3	Stakeholder involvement and coordination
		Y4.4	PBJ Unit Response
		Y4.5	Provider response

Source: Processed Data, 2025

IV. RESULT

Survey consisting of 28 statements was distributed to determine respondents' perceptions, resulting in a representative sample of 52 respondents. Respondents were classified based on five profile categories: age, education, job title, position in the procurement process, experience, and ownership of a procurement process certificate.

Descriptive Analysis

Based on the results of data processing, the average value for each research variable was obtained as shown in Table 6. In general, all variables had values above 3.50 which indicated a positive assessment from respondents regarding the implementation of e-procurement, sustainability, and procurement performance.

The average score of 4.04 indicates that *e-procurement implementation* is in the good category. This reflects that respondents consider the electronic procurement system to be running quite effectively. The sustainability dimension obtained an average score of 3.88, which is in the fairly good category, but relatively lower than other dimensions. This score indicates that sustainable procurement practices have not been optimally implemented, in line with previous research findings that stated that sustainability maturity in higher education institutions tends to be low. The cost performance dimension obtained a score of 4.06, indicating that procurement is considered quite efficient in terms of cost savings, budget control, and process effectiveness. Time performance had an average score of 4.13, which is one of the highest scores. Quality performance had the highest score of 4.20, indicating that the quality of procurement results, both in terms of product/service specifications and conformity to quality standards, was perceived as very good. The service dimension obtained an average score of 4.14, indicating that service in the procurement process, including provider responsiveness, communication, and clarity of information, was considered good by respondents.

Table 6. Average Score of Research Variables

Code	Dimensions	Average Score
X1	E-Procurement	4.04
X2	Sustainability	3.88
Y1	Cost	4.06
Y2	Time	4.13
Y3	Quality	4.20
Y4	Service	4.14

Source: Processed Data, 2025

Relationship Model Analysis

The analysis of the relationship between variables was carried out using *Structural Equation Modeling* – Partial Least Squares (SEM-PLS) to estimate the causal-predictive relationship between the E-Procurement and Sustainability variables on procurement performance. This model tests the influence of two predictor variables e-procurement (X1) and sustainability (X2) on four dimensions of procurement performance, namely cost (Y1), time (Y2), quality (Y3), and service (Y4), as in Figure 2.

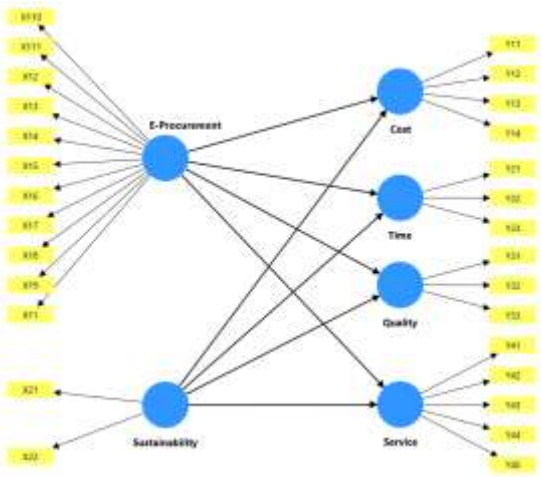

Figure 2. structural model diagram
Source: Processed Smart-PLS 4 (2025)

The figure depicts a structural model consisting of 2 (two) exogenous variables, namely *E-Procurement* and *Sustainability Procurement*, and 4 (four) endogenous variables representing procurement performance, namely Cost, Time, Quality, and Service. This model is designed to test how Variable X1 e-procurement and X2 sustainability procurement affect procurement performance.

Validity and Reliability Test

Table 7. AVE, Cronbach's Alpha and Composite Reliability Results

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	Result
	(>0.7)	(>0.7)	(>0.7)	(>0.5)	
E-Procurement	0.968	0.973	0.972	0.760	**Valid**
Sustainability	0.961	0.967	0.981	0.962	**Valid**

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	Result
	(>0.7)	(>0.7)	(>0.7)	(>0.5)	
Cost Performance	0.802	0.835	0.872	0.633	**Valid**
Time Performance	0.937	0.941	0.960	0.888	**Valid**
Quality Performance	0.941	0.953	0.962	0.895	**Valid**
Service Performance	0.934	0.954	0.950	0.793	**Valid**

Source: SEM-PLS Processed Output, 2025

According to Ghozali (2015:69), *the rule of thumb* commonly used to assess convergent validity is that the loading factor value must be more than 0.7 for confirmatory research and the average variance extracted (AVE) value must be greater than 0.5. Based on the table above, the Average Variance Extracted (AVE) value for each construct is > 0.5, so it can be said that the construct is valid. Furthermore, the Cronbach's alpha value for each construct is > 0.7 and the composite reliability for each construct is > 0.7. Therefore, it can be concluded that all constructs are reliable.

Structural Model Testing

The R-Square (R2) value or coefficient of determination of the Cost construct is 63.3%, the Quality construct is 50.8%, Service is 54.5%, and Time is 57.3%.

Table 8. R Square Value of Endogenous Variables

Endogenous Variables	R-square	Interpretation	Ref
Cost	0.633	strong	Chin (1998)
Time	0.888	very strong	
Quality	0.895	very strong	
Service	0.793	strong	

Source: Processed Results of Sem PLS (2025)

The R-square value in the model indicates the level of ability of exogenous variables to explain variations in endogenous variables. The analysis results show that the *Cost Performance variable* has an R-square value of 0.633, which according to Chin (1998) is included in the strong category, so it can be concluded that the model is able to explain approximately 63.3% of the variation in cost performance. Meanwhile, the *Time Performance variable* obtained a value of 0.888, *Quality Performance* of 0.896, and *Service Performance* of 0.793, all of which are in the very strong category. Thus, these three variables have sufficient predictive power, because more than 60% of their variance can be explained by the independent variables in the model.

The factor with the largest path coefficient value is the most dominant factor.

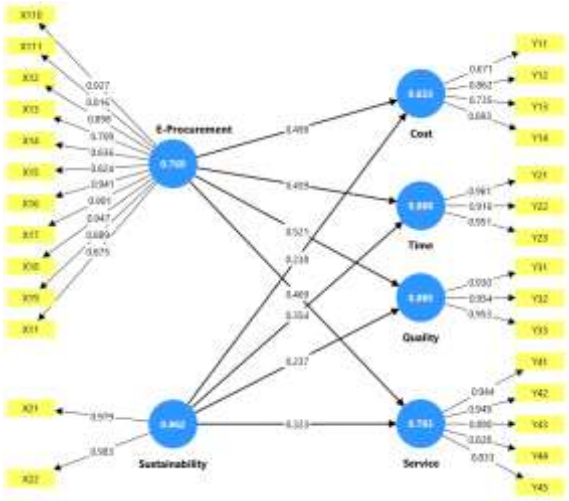

Figure 3. Results Path Coefficient
Source: Processed Smart-PLS 4 (2025)

The SEM-PLS modeling results in Figure 3 show that the E-Procurement construct has a dominant contribution to improving procurement performance, indicated by the high indicator loading value (0.827-0.947) and a significant influence on all performance dimensions. The *E-Procurement Path* to *Time Performance* has the largest coefficient (β = 0.521), indicating that digitalization of the procurement process directly accelerates the tender cycle and contract implementation. Furthermore, the effect on *Cost Performance* (β = 0.499) indicates that *e-procurement* plays a significant role in cost efficiency through process automation, error reduction, and increased transparency. The effect on *Quality* (β = 0.468) and *Service* (β = 0.459) is also significant, although with a smaller value, indicating that quality and service are not only influenced by technology, but also by external factors. Conversely,

the *Sustainability variable*, despite having indicators with very high loadings (0.979–0.983), does not show a significant effect on *cost, time, quality*, or *service.* Its low path coefficient (0.237–0.354) indicates that sustainability practices in higher education institutions are still at an early maturity level and therefore have not been able to directly contribute to procurement performance. The high R^2 values in *the Time* (0.888) and *Quality dimensions* (0.895) shows that the model has very strong predictive capabilities, especially in terms of timeliness and quality of procurement results.

Outer Weight (Formative):

Using formative indicators, pay attention to the outer weight values to see which indicators are most influential in forming latent variables.

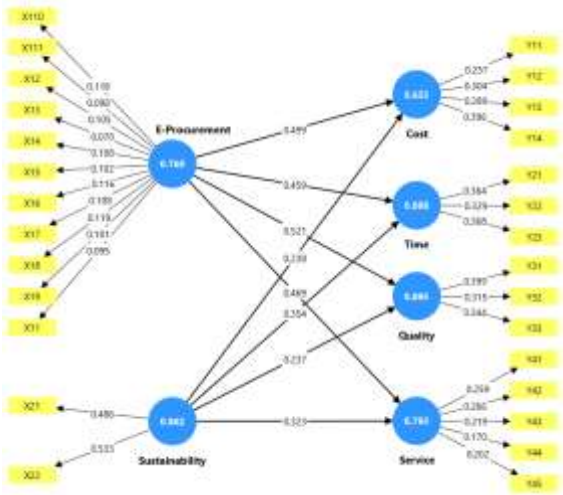

Figure 4. Outer Weights

Table 9. Correlation of e-procurement and sustainability variables with procurement performance

Code	Variables	Correlation X			
		Cost	Quality	Service	Time
X1	e-procurement	0.224	0.258	0.226	0.231
X2	sustainability	0.051	0.053	0.107	0.138

Source: SEM Processed Data, 2025

Based on the results of the correlation test of e-procurement and Sustainability variables on procurement performance variables using the F test, so that it can be categorized as an indicator that has a very significant relationship (strong correlation) and significant (moderate). The correlation results show that the *E-Procurement variable* (X1) has a relatively consistent positive relationship with all dimensions of procurement performance, namely the correlation of X1 to Cost (0.224), Quality (0.258), Service (0.226), and Time (0.231) is in the low but consistent correlation category. This is reasonable considering that procurement performance is not only influenced by process digitalization, but also by other factors such as HR capacity, vendor readiness, contract management, and organizational policies. Meanwhile, the Sustainability variable (X2) shows a lower correlation, each 0.051 to Cost, 0.053 to Quality, 0.107 to Service, and 0.138 to Time. These correlation values are in the very low category, indicating that sustainable procurement practices do not yet have a strong relationship with the dimensions of procurement performance.

Inner Weights Test

The relationship model between e-procurement and sustainability on procurement performance or to find out the path coefficient can be seen from the inner weight results.

Table 10. *Path analysis test results* (inner model)

Relationship between variables	Original sample	Sample mean	Standard deviation	T stat	P values	Result
E-Procurement -> Cost Performance	0.499	0.498	0.181	2,765	0.006	Significant
E-Procurement -> Quality Performance	0.521	0.512	0.191	2,727	0.006	Significant
E-Procurement -> Service Performance	0.469	0.459	0.18	2.61	0.009	Significant
E-Procurement -> Time Performance	0.459	0.443	0.188	2,442	0.015	Significant
Sustainability -> Cost Performance	0.238	0.25	0.183	1,303	0.193	Not significant
Sustainability -> Quality Performance	0.237	0.247	0.174	1,361	0.174	Not significant
Sustainability -> Service Performance	0.323	0.333	0.179	1.8	0.072	Not significant

Relationship between variables	Original sample	Sample mean	Standard deviation	T stat	P values	Result
Sustainability -> Time Performance	0.354	0.369	0.183	1,936	0.053	Not significant

Source: Processed Results of Sem PLS (2025)

The Impact of E-Procurement on Procurement Performance

The results show that e-procurement has a positive and significant influence on all four performance dimensions, with a significance limit of α 5%.

a. E-procurement has an effect on Cost Performance with a path coefficient of 0.499, which is acceptable with a significance level of 2.765, which is greater than 1.96.
b. E-procurement has an effect on Quality Performance with a path coefficient of 0.521, which is acceptable with a significance level of 2.727, which is greater than 1.96.
c. E-procurement has an effect on Service Performance with a path coefficient of 0.469, which is acceptable with a significance level of 2.61, which is greater than 1.96.
d. E-procurement has an effect on Time Performance with a path coefficient of 0.459, which is acceptable with a significance level of 2.441, which is greater than 1.96.

The Impact of Sustainable Procurement on Procurement Performance

Sustainability procurement does not show a significant influence on all dimensions of procurement performance, with a significance limit of α 5%.

a. Sustainability has an effect on Cost Performance with a path coefficient of 0.238, which is acceptable with a significance level of 1.303, which is smaller than 1.96.
b. Sustainability has an effect on Quality Performance with a path coefficient of 0.237, acceptable with a significance level of 0.174, smaller than 1.96.
c. Sustainability has an effect on Service Performance with a path coefficient of 0.323, which is acceptable with a significance level of 1.8, which is smaller than 1.96.
d. Sustainability has an effect on Cost Performance with a path coefficient of 0.354, which is acceptable with a significance level of 1.936, which is smaller than 1.96.

V. DISCUSSION

This section discusses the research findings by connecting the SEM–PLS results, theoretical framework, and discussion aimed at answering two main problem formulations, namely: (1) what indicators are needed to measure e-procurement maturity and sustainability procurement, and (2) how the relationship model of these two variables relates to procurement performance.

Answering RQ1

"What indicators are needed to measure e-procurement and Sustainability variables that influence procurement performance within the framework of procurement governance maturity level?"

The results of RQ1 indicate that e-procurement is a multidimensional construct reflecting all aspects of system, information, and process quality. This is consistent with the theory of DeLone & McLean (2003) and research by Patrucco et al. (2021), which states that digital procurement maturity is determined by transparency, accessibility, data integration, and document standardization. In contrast, sustainable procurement is formed from only two indicators. This proves that sustainability practices in higher education institutions in Indonesia have not yet developed into a complex construct, but are still limited to environmental aspects and basic innovation. This finding aligns with the OECD (2020) which states that the adoption of *sustainable procurement* in developing countries is still in its early stages. Analysis of the measurement model (outer model) using SEM–PLS shows that variables X and Y is formed by 11 valid indicators with loading factors of 0.709–0.947, so that all indicators meet the requirements of convergent validity and reliability.

Answering RQ2

the e-procurement and *sustainability* model relate to procurement performance?

The Impact of E-Procurement on Procurement Performance

The path coefficient analysis revealed that e-procurement maturity has a positive and significant impact on *cost, time, quality, and service*. The test results show that the first hypothesis (H1) is accepted, meaning that improving e-procurement will also improve procurement performance. This aligns with the notion that *e-procurement* significantly contributes to all dimensions of procurement performance. This finding aligns with previous literature (Patrucco et al., 2021; OECD, 2020), which states that procurement digitalization can accelerate the process. increase transparency, reduce administrative errors, strengthening document control, and increase the efficiency of budget use.

The results of the study indicate that e-procurement has the strongest impact on time and cost efficiency, with a time effect of $\beta = 0.521$ and a cost effect of $\beta = 0.499$. This occurs because digitalization of the procurement process directly accelerates workflows, reduces administrative delays, minimizes manual errors, and lowers transaction costs and organizational operational costs (Spacek et al., 2023; Dudic et al., 2024). These findings are consistent with international public research in the education and government sectors (Oniyangi et al., 2024). Meanwhile, the impact of e-procurement on quality and service is also significant, but relatively smaller compared to the dimensions, because quality improvement is more dependent on external factors such as provider competence, technical specifications, supply chain stability, and quality control mechanisms carried out by procurement officials (Gurgun et al., 2024; Patrucco et al., 2021). This is also in line with the findings that service quality in procurement is not only influenced by digital systems, but also by user behavior, organizational culture, HR capacity, and the quality of communication between providers and institutions (Parlindungan et al., 2025).

The Influence of Sustainability on Procurement Performance

The research results show that sustainability has not yet made a statistically significant contribution to procurement performance. This condition is in line with the literature stating that the implementation of *green procurement* and sustainability practices in the public sector of developing countries is often hampered by minimal organizational capacity, limited suppliers that meet environmental standards, the absence of *green specifications*, and the lack of integration of sustainability policies into the organization's core systems and processes (Benchekroun et al., 2024; Bhandari et al., 2025). International research also confirms that the effectiveness of *sustainable procurement* is only seen when an organization reaches a high level of maturity, characterized by the existence of *lifecycle costing*, emission standards, the use of environmentally certified suppliers, and strong support from top management (Testa et al., 2023; Rejeb et al., 2024). The finding that sustainability does not have a significant effect on procurement performance is due to:

a) Sustainability is still administrative in nature
   Sustainable procurement is often only listed as a policy, not yet included in operational practices or technical evaluations.
b) Ongoing vendor limitations
   Most providers do not yet have strong green products, certifications, or sustainability innovations.
c) Green products tend to be more expensive
   So it does not directly contribute to cost efficiency.
d) Lack of internal regulation
   There are no mandatory rules regarding sustainability criteria for each procurement of goods/services.

This finding is consistent with the OECD (2022) which states that developing countries are in the early stages of implementing sustainable procurement, so its impact on performance has not yet been felt.

VI. CONCLUSION

CONTRIBUTION

1. Provides empirical evidence from a public sector context regarding the effectiveness of procurement digitalization and sustainability practices.
2. Adding a new perspective that sustainability procurement is not always significant, depending on the maturity level of the organization

3. Provides an evaluation framework that can be used by procurement units (UPBJ) to optimize e-procurement implementation and sustainability.
4. Preparation of green procurement policies, standardization of PBJ processes, integration of risk registers in the e-procurement system to strengthen procurement governance.

CONTRIBUTION TO FUTURE RESEARCH

This research opens up opportunities for further scientific contributions by providing a theoretical model foundation that can be expanded through the development of more comprehensive sustainability indicators, such as *lifecycle costing*, *circular procurement*, *carbon footprint*, and *eco-certified suppliers*. The research findings also provide space for the exploration of mediation and moderation models, including the relationship between e-procurement through risk management or contract management on procurement performance, as well as the interaction of sustainability with vendor capabilities as a moderating variable. In addition, this study emphasizes the urgency of developing a PBJ maturity model that is more relevant to the Indonesian context, so that it does not fully rely on the OECD or World Bank framework, but reflects the characteristics, needs, and dynamics of national procurement governance.

RESEARCH LIMITATIONS

- Relatively small sample size (N = 52)
- Data collected the sustainability variable consists of only two indicators.
- through perception (subjective questionnaire)

PRACTICAL IMPLICATIONS (FOR UT & PTNBH)

1. E-procurement must remain a priority for digital governance.
   - Because it is proven to directly improve performance
   - Sustainability must be made the next transformation agenda.
     Some steps:
2. establishing green procurement as a mandatory policy,
   - integration of sustainability criteria into technical specifications,
   - development of sustainability-based vendor ratings,
   - HR training related to sustainability standards.
3. Organizations can use these findings to develop a maturity roadmap. With two major phases:
   - Digital Maturity (e-procurement)
   - Sustainability Maturity

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