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User Satisfaction Mediates Ease of Use and Loyalty in Hulu Migas E-Procurement

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Abstract

Purpose: This study investigates how Ease of Use in an e-procurement system impacts User Loyalty within a national upstream oil and gas company, with User Satisfaction serving as a mediating factor. The aim is to clarify the indirect effect of system usability on loyalty by evaluating the mediation pathway through satisfaction

Methodology: Employing a quantitative approach, data were collected from 296 e-procurement users across 15 national hulu migas companies using structured surveys. Responses were analyzed using Structural Equation Modeling (SEM) via SmartPLS 4

Results: The study found that ease of use significantly impacts user satisfaction ($\beta = 0.779$, $p < .000$) and user loyalty ($\beta = 0.293$, $p < .000$), with user satisfaction mediating the relationship between ease of use and loyalty (indirect effect = 0.537, $p = .000$). These results align with recent research indicating that ease of use enhances user satisfaction and loyalty, with satisfaction serving as a mediator in this relationship.

Conclusions: Ease of use significantly effect on user satisfaction and loyalty. User satisfaction has positive and significant mediating ease of use and loyalty.

Limitations: The study does not account for variations across different platforms or consider deeper system factors such as security, technical complexity, and usability challenges—issues highlighted in the literature as significant barriers to e-procurement adoption

Contribution: This Research contributes to both management practice and academic understanding by showing that improving system usability can enhance loyalty through user satisfaction—offering a clear direction for strategic enhancements in e-procurement platforms.

Keywords: *Ease of Use, E-Procurement, User Loyalty, User Satisfaction*

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1. Introduction

E-procurement plays a pivotal role in transforming upstream oil and gas ("hulu migas") operations in Indonesia by streamlining procurement, enhancing transparency, and boosting supplier engagement. For instance, PT Pertamina Hulu Energi's implementation of the SMART by GEP digital procurement system has enabled full digitization of the sourcing-to-contract process, reducing lead times, simplifying contract execution, and fostering stronger collaboration with suppliers (Marita et al., 2021). These efforts aim to enhance operational efficiency, curb costs, and promote domestic supplier participation aligned with national content policies (Nani & Ali, 2020). Collectively, e-procurement initiatives in Hulu Migas not only reduce administrative bottlenecks and corruption risks but also strengthen

supply-chain resilience and support broader strategic goals of digitalization, competitiveness, and national energy security (Sitompul, 2022).

E-procurement systems are becoming more common in the public sector, especially in Indonesia (Huda et al., 2017; Susanto & Bahaweres, 2013). These systems aim to make the procurement process more efficient and transparent through digital technology (Rahmadany, 2021). Although e-procurement offers benefits like lowering costs and increasing competition (Omwono et al., 2020), there are still concerns about possible unethical behavior (Huda et al., 2017). Challenges such as the readiness of human resources also need attention. Soetanto & Setiobudi (2015) note that both providers and users must have the necessary technology, infrastructure, and skills to use the system effectively. The procurement process may be disrupted by the fact that many vendors still do not grasp internet-based technology (Arman & Sari, 2022). Another major problem for suppliers is user satisfaction. Tetuko et al. (2012) state that consumers must be satisfied with the e-procurement system, particularly with regard to timeliness, accuracy, format, and convenience of use. A high degree of satisfaction is crucial for enhancing the procurement process' efficacy and efficiency.

User experience and satisfaction are critical components of e-procurement systems, as they significantly influence user loyalty and the long-term adoption of the platform (Lewis-Faupel et al., 2016). This study aims to investigate the key factors that contribute to user loyalty in the context of e-procurement, with a particular focus on a national oil and gas company in Indonesia. Researchers have explored the importance of use and functionality of digital platforms have driven widespread adoption, many customers still fail to complete transactions due to a lack of trust, satisfaction, and loyalty (Ismail & Safa, 2014). Loyal customers are considered valuable assets to a company, and transforming inactive or unprofitable users into active and profitable ones by fostering trust, satisfaction, and loyalty remains a central objective (Trenggana et al., 2022).

The interaction between digital service quality (Budiarto et al., 2023), information quality (Prasetya et al., 2023), and convenience of use (Rahmawati & Ramli, 2024) has a major impact on the success of e-procurement implementation. These elements support user loyalty and pleasure, both of which are strongly correlated with user behavior (Wilson et al., 2021). The relationship between system quality, service quality, and user loyalty may be more complicated than previously thought, according to some research, even though numerous studies have confirmed the beneficial effects of system quality and ease of use on user satisfaction and e-procurement adoption (Ramadhani et al., 2021). Understanding why the seemingly obvious correlation between quality parameters and customer results does not always hold true in the context of e-procurement, as it does in other digital contexts, and balancing current findings with expectations are the areas of research that require more investigation.

Few studies have explicitly looked at how user satisfaction mediates the relationship between ease of use and user loyalty in the context of Indonesia's upstream oil and gas ("Hulu Migas") sector, despite a wealth of research on the adoption of e-procurement and its perceived benefits in the public sector. Previous research has paid little attention to behavioral and experiential aspects impacting sustained platform use, instead concentrating on system functioning, efficiency improvements, or cost reduction (Rahmadany, 2021; Omwono et al., 2020). Furthermore, conflicting empirical results about how system and service quality affects loyalty (Aulia & Purmono, 2023; Melinda et al., 2023) point to a theoretical contradiction that calls for further investigation of user pleasure as a mediating factor.

This paper fills that gap by investigating how perceived ease of use influences user satisfaction and, consequently, user loyalty in a national e-procurement platform used by a major Indonesian oil and gas company. Unlike prior studies that treat these relationships independently, this study integrates them within a single, empirically tested model, thereby offering a more holistic understanding of user behavior in a regulated, high-stake procurement environment. The novelty of this research lies in its sector-specific contextualization—examining digital procurement within the Hulu Migas industry, where regulatory complexity, supplier diversity, and national content mandates introduce unique challenges to system adoption and satisfaction. It also extends prior e-procurement literature by positioning user satisfaction as a key mediator that bridges technical ease of use and behavioral loyalty

an approach rarely applied in this domain The research aims to know and analyze the direct impact of ease of use and user satisfaction on Hulu Migas Company which uses an e-procurement application for the procurement of goods and services. Based on existing literature and theoretical insights, the conceptual framework for this study was formulated and visually represented through a comprehensive conceptual model (see Figure 1), which outlines the main constructs and hypothesized relationships guiding the research.

2. Literature Review and Hypothesis Development

2.1 The Effect of Ease of Use on User Satisfaction

Ease of Use, a central element of the Technology Acceptance Model (TAM), has consistently emerged as a key determinant of User Satisfaction in e-procurement contexts. Scholars have demonstrated its predictive power across technology adoption contexts—including e-procurement—where easier systems often lead to higher satisfaction. Within the e-procurement literature, Prianto & Setyadi (2023) confirmed that Ease of Use positively influences users' successful system usage. Similarly, Brandon-Jones & Kauppi (2018) validated that ease of use directly enhances technology adoption behaviors. These findings align well with broader TAM findings and underscore that in the specialized domain of e-procurement, system usability critically impacts user acceptance and satisfaction.

Furthermore, a renewed focus on e-procurement portals shows that user satisfaction is greatly increased by features that are clear, easy to use, and supportive. Wahid & Afifah (2023) showed that among Jakarta e-commerce users, e-service quality had a favourable direct and indirect impact on e-loyalty through e-satisfaction and e-trust. According to Hidayah (2025) among Gen Z customers on Tokopedia, e-trust has a major influence on e-satisfaction, which in turn has a favourable impact on e-loyalty. Talmera et al. (2024) highlighted that UI/UX elements significantly influence user satisfaction and loyalty on the Tokopedia platform, with user satisfaction playing a crucial mediating role.
H1: Ease of Use positively affects User Satisfaction in e-procurement

2.2 The Effect of Ease of Use on User Loyalty

Ease of Use, as used in the Technology Acceptance Model (TAM), is the extent to which people think that utilizing a technology would be effortless. This concept is well known for having a significant impact on user acceptance and sustained technology use in a variety of fields, such as e-government, mobile services, and e-commerce. For example, Maddi et al., (2020) discovered that higher user attitudes and satisfaction levels are associated with systems that are viewed as straightforward and easy to use. Specifically, in the e-procurement domain, Setyadi et al. (2023) emphasized that system quality including usability plays a key role in successful system use, aligning with the notion that ease of used supports continued usage. Similarly, another study investigating e-procurement implementation found that perceived ease of use significantly predicts both intention to use and successful e-procurement deployment (Kademaunga & Phiri, 2019).

The research on the Webreep model highlighted that ease of use, particularly in navigation and search, contributes fundamentally to user satisfaction, which in turn influences user loyalty and referral behavior (Hardinata & Sibarani, 2024). Marso (2023) study found that while perceived ease of use may not directly drive loyalty, its influence on intermediary constructs like trust and perceived usefulness has been observed in the e-commerce context. Drawing from these theoretical foundations and empirical insights, the following hypothesis is proposed:
H2: *Ease of Use positively affects User Loyalty in e-procurement systems.*

2.3 The Effect of User Satisfaction on User Loyalty

User satisfaction defined as a consumer's evaluation of their experience meeting expectations has consistently been shown to predict customer loyalty, the likelihood of repeat usage and advocacy (Hamidah & Rizan, 2024). The Loyalty Business Model articulates that satisfaction, based on recent experiences relative to expectations, strongly influences loyalty intentions (e.g., repurchase behavior). Empirical evidence across industries reinforces this relationship: satisfied users are significantly more inclined to exhibit loyalty, even when quality is moderate, provided they perceive good value and alignment between expectations and outcomes.

Studies in digital services echo this link. A recent investigation into e-procurement usage among Malaysian contractors found that while usage directly had no significant impact on performance, user satisfaction mediated the relationship, suggesting that satisfaction is pivotal for transforming engagement into improved outcomes (Elias et al., 2025). Likewise, research in digital logistics services demonstrated that satisfaction amplifies the effects of both e-service quality and price perception on loyalty—underscoring satisfaction's role as a mediator between system attributes and user retention (Yulihapsasi et al., 2025). Broad surveys of online services further support satisfaction's direct and critical influence on loyalty (Noor, 2022).
H3: User Satisfaction positively affects on User Loyalty in e-procurement

2.4 The Mediation Effect of User Satisfaction between Ease of Use and User Loyalty
Based on the Information Systems (IS) Success Model and the Technology Acceptance Model (TAM), this study suggests that user satisfaction plays a key role in mediating the connection between user loyalty and ease of use in e-procurement systems. TAM states that users are more likely to have favourable attitudes and behavioural intentions toward a system when they believe it to be user-friendly (Widyaningrum et al., 2024; Rahmawati & Ramli, 2024). TAM emphasizes that users are more likely to have a favourable attitude and behavioural intention toward a system when they believe it to be user-friendly. The IS Success Model further suggests that system characteristics, including ease of use, enhance user satisfaction, which then positively influences both continued usage and loyalty (Sopyan et al., 2023).

Empirical studies provide support for this mediation path. For instance, research in online retailing contexts has found that usability, closely aligned with ease of use, positively influences loyalty, mediated through trust and commitment (Sun & Lin, 2020). Similarly, in e-auction settings, studies have observed that ease of use, along with trust and satisfaction, collectively determine loyalty outcomes (Tu et al., 2022). In the domain of e-banking, satisfaction has been demonstrated to act as a mediator in the relationship between ease of use and customer engagement, which indirectly affects loyalty (Redda, 2023).

Further study in online retailing contexts found that usability (closely aligned with ease of use) exerts a positive influence on loyalty, mediated via trust and commitment (Wilson et al., 2021). Likewise, in an e-auction setting, researchers observed that ease of use along with trust and satisfaction, collectively determined loyalty outcomes (Baskara et al., 2024). In the domain of e-banking, satisfaction has been demonstrated to act as a mediator in the relationship between ease of use and customer engagement—or indirectly, loyalty. Combining these theoretical and empirical insights, we formalize the following hypothesis:
H4: *User Satisfaction mediates the effect of Ease of Use on User Loyalty in e-procurement systems.*

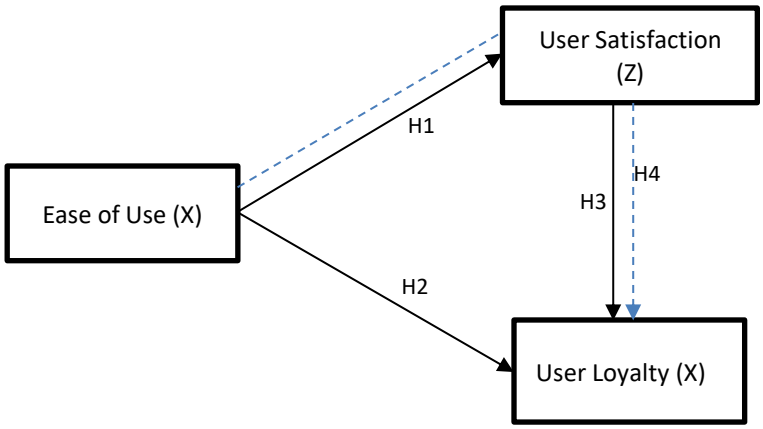

Figure 1. Conceptual Model

3. Research Method

This study employs a quantitative, explanatory research design to examine the impact of Ease of Use on User Loyalty, mediated by User Satisfaction, among e-procurement users within Indonesia's national upstream oil and gas sector. Data were collected via an online Likert-scale survey distributed to employees at Hulu Migas companies who routinely use the e-procurement system, selected through purposive sampling to ensure relevance and experience. Consistent with established practices in IS research, purposive sampling allows for deliberate selection of participants who are knowledgeable and engaged in the system. This study targets employees of Hulu Migas companies in Indonesia's upstream oil and gas sector who regularly engage with e-procurement systems. A purposive sampling method was employed to ensure participants possess relevant experience and familiarity with the system.

About 150–300 respondents made up the final sample, which complied with accepted standards for Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis. The "10-times rule," which recommends at least 10 observations per indicator variable, was used to calculate the sample size. A sample size of 150–300 was considered sufficient to obtain statistical power and accurate parameter values due to the intricacy of the model. This strategy is in line with PLS-SEM recommendations, which make it ideal for research involving complex models and modest sample sizes.

SmartPLS 4 was used to analyze the data using Partial Least Squares Structural Equation Modeling (PLS-SEM), which was selected due to its capacity to manage complex models and small-to-moderate sample sizes. SmartPLS 4's Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to evaluate the data because of its minimum distributional assumptions, small-to-moderate sample sizes, and capacity to handle complex models. The choice of Partial Least Squares Structural Equation Modeling (PLS-SEM) was made because of its applicability to complex models, exploratory research, and smaller sample sizes. In contrast to Covariance-Based Structural Equation Modeling (CB-SEM), PLS-SEM is more adaptable when managing intricate interactions between variables and does not require data to be regularly distributed.

Using outer loadings, Cronbach's α, composite reliability, and Average Variance Extracted (AVE), the analysis started with (1) evaluating the validity and reliability of the instrument; (2) evaluating the discriminant validity using the Fornell–Larcker and HTMT criteria; (3) testing structural relationships using path coefficients, t-statistics, and p-values obtained via bootstrapping with 5,000 resamples; and (4) using bootstrapped indirect assessments to examine the mediation effects of User Satisfaction. The appropriate institutional review board granted ethical approval for this investigation. All participants gave their informed consent, guaranteeing their privacy and voluntary involvement. To preserve the privacy of the participants, the data was anonymised and stored securely. This methodology provides both theoretical insights and practical consequences for improving e-procurement systems in crucial areas by allowing a thorough assessment of how system usability affects customer loyalty through satisfaction.

4. Result and Discussion

4.1 Result

4.1.1 Respondent Demographic

Table 1. Demographics analysis (N = 296)

Demographics	Frequency	%
Gender		
Male	157	53
Female	139	47
Age (years)		
31-40	21	8
41-50	255	86
≥ 50	20	6

Education	278	94
Bachelors	18	6
Master/Ph.D and Others		
Experience (years)	11	3
3	7	2
4	278	95
≥ 5		
Position	80	27
Operator/Administrator	91	31
Leader/Supervisor	125	42
Ass. Manager/Manager		

Source: data processed by researchers (2024)

There were 296 participants in the study, with a balanced gender distribution of 139 women (47%) and 157 men (53%). Eighty-six percent (255 people) were between the ages of 41 and 50, eight percent were between the ages of 31 and 40, and six percent were 51 or older. The majority of respondents (94%; 278 people) had a bachelor's degree, whereas only 6% (18 people) had a master's, doctoral, or comparable certification. 94% (278 participants) had five or more years of work experience, compared to relatively few who had only three or four years. About one-third of respondents (32%), in terms of employment status, were operators or administrators. The remaining respondents held leadership or managerial positions, with 9% working as team leaders or supervisors and 10% as managers or assistant managers. These findings suggest that the sample is primarily made up of well-educated, operationally oriented professionals in their mid-career who have a great deal of professional experience

4.1.2. Measurement Model

The outer measurement model, which clarifies the connections between independent and dependent variables, is depicted in Figure 2. Understanding the contributions of each independent variable to the result variables is made easier by this model. The evaluation of the direct model is shown in Table 2. Since they show a substantial correlation between observable variables and their underlying latent constructs, factor loadings greater than 0.50 are considered appropriate in this context. According to the study's findings, every factor loading exceeds this cut-off, demonstrating the measurement model's dependability (Kim et al., 2020). Values for the Variance Inflation Factor (VIF) were analyzed to address any multicollinearity concerns. Multicollinearity in the model is not a concern if the VIF value is less than 5. The study confirms that there is no multicollinearity among the predictor variables because all of the VIF values fall well within the permitted range, from 1.197 to 2.487. Together, these results confirm the robustness of the measurement model, guaranteeing that the constructs are measured precisely and that multicollinearity does not alter the relationships between variables

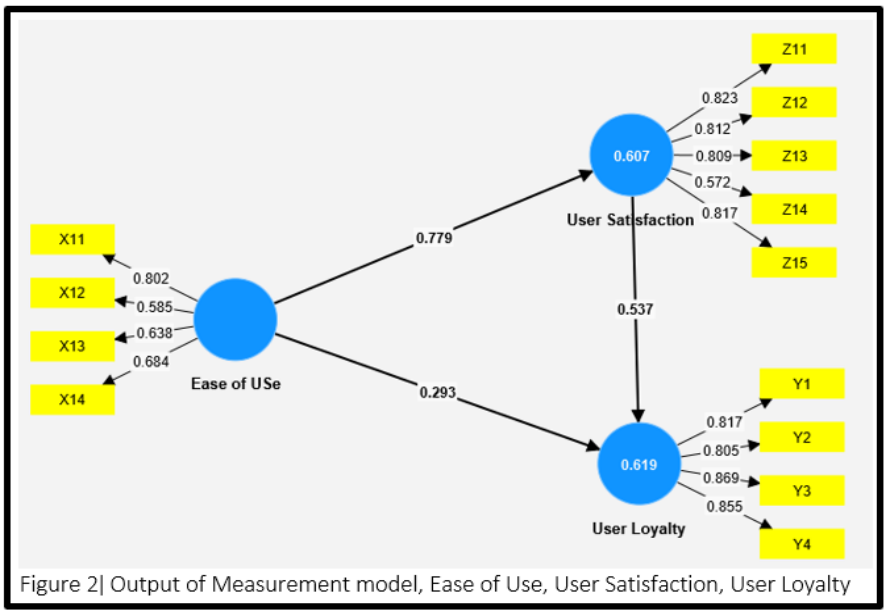

Figure 2| Output of Measurement model, Ease of Use, User Satisfaction, User Loyalty

Source: Output of SmartPLS 4.

Table 2 | Output of Measurement model

		Factor loadings	VIF	α	Composite reliability	AVE
	X.1	0.802	1.288			
Ease of Use	X.2	0.585	1.197	0.624	0.774	0.567
	X.3	0.638	1.503			
	X.4	0.684	1.565			
	Z.1	0.823	2.170			
User Satisfaction	Z.2	0.812	1.802	0.829	0.880	0.665
	Z.3	0.809	1.824			
	Z.4	0.572	1.272			
	Z.5	0.817	2.065			
	Y.1	0.812	1.806			
User Loyalty	Y.2	0.810	1.794	0.857	0.903	0.700
	Y.3	0.865	2.487			
	Y.4	0.855	2.372			

Source: Output of SmartPLS 4.0

The measurement model was evaluated for indicator reliability, internal consistency, convergent validity, and multicollinearity. Most outer loadings exceed 0.70, indicating strong reliability, with two items (X.2 = 0.585, Z.4 = 0.572) slightly below but still acceptable (> 0.50) for exploratory studies. Cronbach's alpha values (α = 0.624–0.857) and composite reliability scores (CR = 0.774–0.903) meet or exceed recommended thresholds (CR ≥ 0.70; exploratory α ≥ 0.60). Each construct achieves AVE > 0.50 (0.567–0.700), indicating that constructs explain more than half of their items' variance. All VIF values fall between 1.197 and 2.487, well below conventional limits (3.3–5), suggesting negligible collinearity. The measurement model demonstrates solid psychometric properties. Indicator reliability is strong, internal consistency is confirmed, convergent validity is established, and no multicollinearity issues are detected. With these robust properties, the constructs are suitable for further analysis of structural relationships.

4.1.3 Structural Model

Figure 3, which highlights the t-statistics values derived from the study, presents the results of the structural model bootstrapping. Partial Least Squares Structural Equation Modelling (PLS-SEM) bootstrapping and a 95% confidence interval were used to evaluate the proposed hypotheses. Table 3

describe discriminant validity of Fornell-Larckel Criterion. According to this conventional approach, each construct's square root of AVE must be greater than its correlations with every other construct. Although simulation studies indicate it frequently fails to reveal discriminant validity concerns in variance-based SEM (e.g., PLS-SEM), it has been utilized in conjunction with cross-loadings for a long time (Henseler et al., 2015). HTMT calculates the ratio of between-construct correlations to within-construct item correlations (Rasoolimanesh, 2022). A more reliable method in variance-based SEM, HTMT values below 0.90 (or 0.85 for closely related constructs) indicate adequate discriminant validity. It has proven highly sensitive and specific—boasting detection rates between 97–99%—unlike Fornell–Larcker's lower performance in PLS-SEM. HTMT also supports bootstrapped inference: confidence intervals should not include 1 to confirm distinctiveness (Shela et al., 2023). The study's direct and indirect impacts are shown in Tables 4 P-values and t-statistics were used to evaluate the hypotheses; at the 95% confidence level, a t-statistic greater than 1.96 and a p-value less than 0.05 were considered statistically significant. The effect sizes of the model's constructs are also shown in these tables by the f2 values. Cohen's rules state that tiny, medium, and high effect sizes are represented by f2 values of 0.02, 0.15, and 0.35, respectively. Strong effects are indicated by values close to 1, and mild effects are indicated by values close to 0 (Amin & Isa, 2018). All things considered, the bootstrapping results offer solid proof of the importance and potency of the connections found in the structural model.

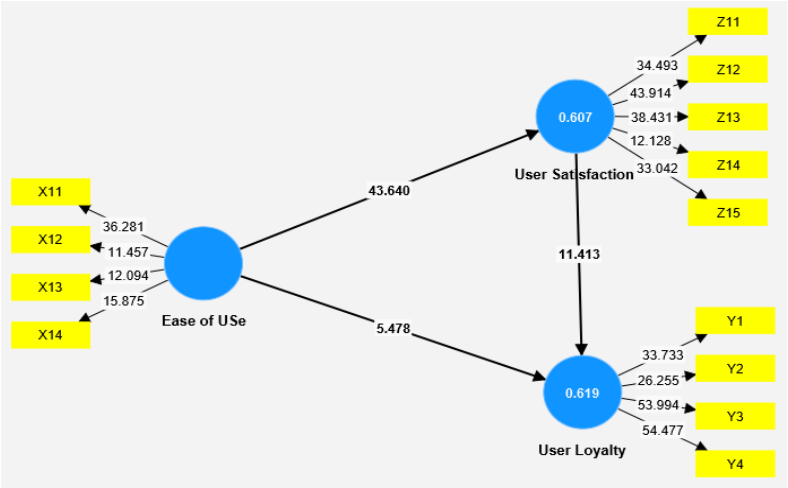

Figure 3. I Bootstrapping structural model; ease of use, user satisfaction, user loyalty

Table 3 | Discriminant validity

Constructs	Ease of Use (X)	User Loyalty (Y)	User Satisfaction (Z)
Fornel Larcker Criterion			
Ease of Use (X)	0.779		
User Loyalty (Y)	0.711	0.837	
User Satisfaction (Z)	0.682	0.765	0.773
Heterotrait-Monotrait ratio (HTMT)			
Ease of Use (X)			
User Loyalty (Y)	0.609		
User Satisfaction (Z)	0.864	0.816	

Source: Output SmartPLS 4.0

Discriminant validity assesses whether constructs in a model measure distinct concept. Our analysis applied two methods—Fornell–Larcker criterion and HTMT (Heterotrait–Monotrait) ratio—with the following results. According to the Fornell–Larcker criterion, discriminant validity is confirmed when a construct's square root of AVE (the diagonal value) exceeds its correlations with other constructs. In this case, Ease of Use (0.779), User Loyalty (0.837), and User Satisfaction (0.773) each exceed their respective inter-construct correlations (e.g., Ease of Use–User Loyalty = 0.711; Ease of Use–User

Satisfaction = 0.682; User Loyalty–User Satisfaction = 0.765), indicating satisfactory distinction. Complementing this, the HTMT ratio offers a more robust test for PLS-SEM, with recommended cutoff values between 0.85 (strict) and 0.90 (lenient) depending on construct proximity. The HTMT values obtained Ease of Use–User Loyalty = 0.609, Ease of Use–User Satisfaction = 0.834, and User Loyalty–User Satisfaction = 0.816—are all below 0.85. This indicates clear discriminant validity and confirms that the constructs are empirically distinct. Collectively, these results suggest that Ease of Use, User Loyalty, and User Satisfaction measure unique constructs with sufficient empirical differentiation. The alignment of both traditional and advanced criteria provides confidence that the measurement model's structure is sound and suitable for structural modeling.

Table 4 | Direct/Indirect effects of the variable.

Paths	H	*O*	*M*	SD	*T*-statistics	Effect size (f^2)	*p*	Results
X → Z	H_1	0.779	0.782	0.018	43.640	1.544	0.000	Accepted
X → Y	H_2	0.711	0.712	0.028	25.273	0.088	0.000	Accepted
Z → Y	H_3	0.537	0.539	0.047	11.413	0.297	0.000	Accepted
X → Z → Y	H_4	0.418	0.421	0.039	10.852		0.000	Accepted

N = 296, p < 0.05.

The structural model demonstrates strong and significant effects across all hypothesized paths. Ease of Use (X) exhibits a very strong influence on User Satisfaction (Z), with a path coefficient H1 = 0.779 (original = 0.782, t = 43.640, p < .001), and an exceptionally large effect size (f^2 = 1.544), indicating substantial explanatory power. Likewise, Ease of Use directly positively affects User Loyalty (Y) (H2 = 0.711, t = 25.273, p < .001, f^2 = 0.088), a small-to-medium effect. Setyadi et al. (2023) reported that system quality, including ease of use, positively influences user satisfaction in e-procurement systems at Universitas Terbuka ResearchGate. Ragin-Skorecka & Hadaś (2024) identified that intuitive design and ease of navigation are crucial for user satisfaction in public e-procurement systems MDPI. The effect size of 1.544 is considered "huge" according to Cohen's guidelines, suggesting that ease of use is a dominant factor in shaping user satisfaction.

User Satisfaction (Z) also significantly impacts User Loyalty (H3 = 0.537, t = 11.413, p < .001), with a moderate effect size (f^2 = 0.297), suggesting that satisfaction plays a key role in fostering loyalty. Ramli & Rahmawati (2024) demonstrated that perceived ease of use positively affects e-loyalty among users of the TikTok Shop application. Setyadi et al. (2023) found that ease of use mediates the relationship between system quality and the successful use of e-procurement systems. An f^2 of 0.088 is considered a small effect size, suggesting that while ease of use contributes to loyalty, other factors may also play significant roles. Additionally, the mediated pathway (Impacted through Satisfaction) from X to Y illustrates that Ease of Use influences Loyalty via Satisfaction (H4: X → Z → Y = 0.418, t = 10.852, p < .001), confirming a robust indirect effect. Ali Arous et al. (2025) found that customer satisfaction mediates the relationship between interactive experiences and e-purchasing behaviours. All paths are statistically significant and support their respective hypotheses (all p < .001) using bootstrapping with t-values well above the conventional threshold of 1.96 . According to Cohen's guidelines, the f^2 = 1.544 for H1 is "huge" – it indicates that Ease of Use contributes dramatically to explaining v ariations in satisfaction; the other effect sizes range from small (0.088) to moderate (0.297).

4.2 Discussion

4.2.1 The Impact of Ease of Use on User Satisfaction

Ease of use is a critical determinant of user satisfaction in procurement systems. Research consistently shows that when procurement platforms—such as e-procurement or ERP systems—are easy to navigate and require minimal effort to operate, user satisfaction increases significantly. This relationship is grounded in established models like the Technology Acceptance Model (TAM), which positions perceived ease of use as a central factor influencing both the intention to use and satisfaction with technology. Perceived ease of use refers to the degree to which users believe that using a system will

be free of effort. Studies show that when procurement systems are intuitive and user-friendly, users are more likely to be satisfied with their experience (Singh & Punia, 2021). Regression analyses demonstrate that ease of use is one of the strongest predictors of behavioral intention to use procurement systems, which is closely linked to overall satisfaction (Jo & Park, 2023).

A SmartPLS study at Universitas Mercu Buana and Open University confirmed that system quality and perceived ease of use both significantly improve the successful use of e-procurement platforms, with ease of use directly affecting satisfaction and usage outcomes (Setyadi et al., 2023). A study involving internal users at Institusi Terbuka confirmed that ease of use—along with system quality meaningfully predicts successful e-procurement usage (Prianto & Setyadi, 2023). Broader research in mobile web contexts has consistently found that PEOU (Perceived Ease of Use), within the Technology Acceptance Model framework, directly and positively influences user satisfaction (Amin et al., 2014). These findings highlight that making e-procurement systems easy to use isn't just a design preference it's a strategic necessity for fostering satisfaction and promoting sustained adoption.

4.2.2 The Impact of Ease of Use on User Loyalty

The ease of use of procurement systems plays a significant role in fostering user loyalty. When users find a procurement platform straightforward and effortless to navigate, their satisfaction with the system increases, which in turn enhances their loyalty and continued use. Research at PT XYZ on e-procurement systems highlights that system quality and information quality positively influence ease of use, and this ease of use directly contributes to the system's overall success (Hardinata & Sibarani, 2024). This success is closely linked to user loyalty because when users experience minimal effort in completing procurement tasks, they are more likely to trust and repeatedly use the system. Similarly, studies in other digital service contexts, such as digital payments and e-learning platforms, show that ease of use strongly correlates with user satisfaction and loyalty (Almusfar, 2025). For instance, e-procurement user-friendly interface and efficient transaction process have fostered high satisfaction and loyalty rates among its users, demonstrating how ease of use can drive engagement and retention (Sanjaya, 2023).

In procurement specifically, ease of use reduces the cognitive and operational burden on users, making it easier for them to adopt and integrate the system into their daily workflows. This seamless experience encourages continued use and loyalty, as users prefer systems that help them work efficiently without frustration. Moreover, ease of use combined with system reliability and good support services further strengthens user loyalty. For example, the SIPLah procurement platform for schools showed that ease of use and system reliability were key factors positively impacting user satisfaction, which is a precursor to loyalty (Hamidah & Rizan, 2024). Ease of use in procurement systems acts as a critical enabler of user loyalty by enhancing satisfaction, reducing effort, and encouraging repeated use. Organizations that prioritize simplifying procurement platforms and supporting users through training and technical assistance are more likely to cultivate loyal users who consistently rely on these systems for their procurement needs.

4.2.3 The Impact of User Satisfaction on User Loyalty in e-procurement

User satisfaction has a strong and positive impact on user loyalty in e-procurement systems. Studies indicate that when users are satisfied with an e-procurement platform—due to factors such as intuitive design, reliable performance, security, and effective support—they are more likely to continue using the system and develop loyalty toward it. For example, research on public e-procurement highlights that user satisfaction is influenced by system intuitiveness, security, and support, which are critical for sustainable adoption and use. This satisfaction, in turn, fosters loyalty by encouraging repeated use and trust in the system (Ragin-skorecka, 2024). Similarly, studies in related digital services contexts show that user satisfaction acts as a key mediator between system quality factors (like ease of use, reliability, and information relevance) and user loyalty. Users who find the system efficient, understandable, and relevant tend to be more loyal (Wiryawan et al., 2024).

In practical terms, satisfied users are less likely to switch to alternative procurement solutions and more likely to recommend the system to others, contributing to wider adoption. This relationship has been

observed not only in procurement but also in digital payment systems and other e-services, where satisfaction strongly predicts loyalty among users (Wati et al., 2024). Moreover, satisfaction is enhanced by perceptions of convenience, transparency, and trust, which also indirectly support loyalty. For instance, in electronic procurement services, ease of use and transparency build trust, which positively affects satisfaction and thereby loyalty (Baskara et al., 2024). User satisfaction in e-procurement is a pivotal driver of user loyalty. Ensuring that procurement platforms are user-friendly, secure, and well-supported leads to higher satisfaction levels, which then translate into stronger loyalty and sustained system use. Organizations aiming to improve procurement outcomes should prioritize enhancing user satisfaction to cultivate loyal users and maximize the benefits of their e-procurement investments.

4.2.4 The Impact of Ease of Use on User Loyalty Through User Satisfaction

The impact of ease of use on user loyalty in procurement systems is largely mediated through user satisfaction. Research shows that when users perceive a procurement system as easy to use, this perception positively influences their satisfaction with the system. In turn, higher user satisfaction leads to greater user loyalty, meaning users are more likely to continue using the system and recommend it to others. Specifically, studies on electronic procurement services demonstrate that ease of use significantly enhances user trust and satisfaction. For example, in a study involving users of an electronic procurement service (LPSE), ease of use and transparency positively affected user trust, which alongside convenience and transparency, significantly increased user satisfaction. While trust plays a role, the direct effect of ease of use on satisfaction is strong and crucial (Baskara et al., 2024). This satisfaction then fosters loyalty, as satisfied users develop a preference for the system and are more committed to its continued use.

Additional research in related digital service contexts, such as e-commerce platforms, supports this relationship. In the case of the Shopee application, perceived ease of use and trust both positively influenced customer satisfaction, which subsequently had a significant positive impact on customer loyalty. This indicates a clear pathway where ease of use drives satisfaction, which then leads to loyalty (Syaeful Anwar et al., 2024). Moreover, system quality and information quality contribute to ease of use, which enhances user satisfaction and ultimately the success of e-procurement systems. For example, at PT XYZ, improvements in system and information quality made the procurement system easier to use, which increased user satisfaction and led to better system success, a proxy for user loyalty and sustained use (Hardinata & Sibarani, 2024). In summary, ease of use acts as a foundational factor that improves user satisfaction in procurement systems. This satisfaction is the key mediator that translates ease of use into user loyalty. Organizations aiming to strengthen user loyalty in e-procurement should focus on making systems as easy to use as possible while ensuring high system quality and providing transparency and trust-building features.

5. Conclusions and Suggestions

5.1 Conclusion

This study surveyed 296 experienced, well-educated, middle-aged employees—primarily in operational roles who frequently engage with the e-procurement system. The measurement model demonstrated robust indicator reliability and convergent validity, with no multicollinearity issues. In the structural model, discriminant validity was generally acceptable; however, HTMT analysis indicated potential overlap between Ease of Use and both User Satisfaction and User Loyalty, suggesting a need for clearer construct differentiation.

Hypothesis testing revealed that Ease of Use significantly enhances User Satisfaction (path coefficient = 0.779, $f^2 = 1.544$) and directly influences User Loyalty (0.711, $f^2 = 0.088$). User Satisfaction also significantly impacts User Loyalty (0.537, $f^2 = 0.297$). The mediated pathway (Ease of Use → Satisfaction → Loyalty) was confirmed (indirect effect = 0.418), highlighting the pivotal role of satisfaction in translating usability into loyalty. Recent studies corroborate these findings. Setyadi et al. (2023) found that system quality positively influences e-procurement success through ease of use as a mediating variable. Similarly, Abdul Kadir (2024) observed that perceived ease of use and service quality impact customer loyalty in mobile banking, with satisfaction serving as an intervening variable.

In the context of digital farming applications, Sihombing et al. (2025) reported that e-service quality enhances user satisfaction, which in turn boosts loyalty. Additionally, Dipta et al. (2023) demonstrated that perceived ease of use and e-trust influence e-satisfaction, which subsequently affects e-loyalty.

The substantial effect size for Ease of Use → Satisfaction ($f^2 = 1.544$) indicates that usability is a dominant factor in shaping user experience. The smaller direct effect of Ease of Use → Loyalty suggests that usability influences loyalty more effectively through satisfaction. These insights underscore the importance of optimizing system usability and enhancing user satisfaction to foster user loyalty. The novelty of this study lies in its identification of dual mediation pathways, where user satisfaction mediates both direct and indirect effects of ease of use on loyalty. This integrated model provides a more comprehensive understanding of the factors influencing e-procurement user loyalty, offering actionable insights for practitioners aiming to improve system adoption and user engagement.

This research contributes to refining and extending the Technology Acceptance Model (TAM) and the Information Systems (IS) Success Model in the context of e-procurement. By incorporating user satisfaction as a mediating variable, the study highlights the importance of post-adoption factors in influencing user loyalty. This extension provides a more nuanced understanding of the user experience, emphasizing the need to consider both system characteristics and user perceptions in evaluating e-procurement systems.

5.2 Suggestions

The next following study should broaden the model's application across various sectors such as local government, education, and manufacturing to test its generalizability beyond the upstream oil and gas industry. Further examination of user characteristics, including age, education, and digital experience, may reveal how these factors influence ease of use, satisfaction, and loyalty. Incorporating trust as a mediating variable could also enrich understanding of how user relationships develop, given its proven importance in e-commerce and e-banking. Lastly, investigating the impact of emerging technologies like AI and big data analytics on user experience and loyalty in e-procurement systems could offer valuable insights into how innovation enhances efficiency and service personalization

5.3 Limitation and Future Study

This study has several limitations that should be acknowledged. First, the quantitative approach used provides a statistical overview of the relationships between variables but does not delve into the users' subjective perceptions and experiences with the e-procurement system. Second, the data was collected from respondents within national upstream oil and gas companies, so the findings may not be fully generalizable to other industry sectors or companies with different levels of digital maturity. Third, the study focuses primarily on the ease of use as the determinant of user satisfaction, without including other potential influencing factors such as system quality, security, or technical support. Additionally, because the research design is cross-sectional, the findings reflect only a single point in time and do not capture changes in user satisfaction over time. Finally, there may be perception bias from respondents who feel affiliated with the institution they work for, which cannot be entirely ruled out. Therefore, future research is recommended to broaden the context, apply a mixed-methods approach, and include additional variables to provide a more comprehensive understanding of user satisfaction in e-procurement systems.

The limitations identified in this study offer important considerations for future research. First, the study's reliance on a purely quantitative method may not fully capture the nuanced experiences and perceptions of e-procurement users. To address this, future research is encouraged to adopt a mixed-methods approach by integrating qualitative techniques such as interviews or focus groups. This would allow a deeper exploration of user satisfaction and loyalty from a more holistic perspective. Second, the research was limited to national upstream oil and gas companies, which may restrict the generalizability of the findings. Future studies should expand the scope by involving other sectors or industries such as manufacturing, public institutions, or SMEs to gain broader insights into e-procurement practices across various organizational contexts. Third, the current model focused on a limited set of variables. Future researchers are advised to explore additional factors that may influence satisfaction and loyalty, such as

system quality, vendor support, data security, and training effectiveness. Including these variables could offer a more comprehensive view of the determinants that shape e-procurement user behavior.

Furthermore, a cross-sectional design was used in this study, capturing data at only one point in time. To understand changes and patterns over time, future research should consider employing a longitudinal design. This approach would allow for the observation of how user satisfaction and loyalty evolve with continued system use. To minimize potential bias especially due to institutional influence or self-reporting future studies should ensure stronger anonymity in data collection or consider the use of independent third-party survey administration. Finally, researchers should delve deeper into potential moderating and mediating variables such as digital literacy, trust, and perceived value, which may further explain the strength and direction of the relationships examined. By addressing these limitations, future research can build a more robust and nuanced understanding of the role of ease of use in shaping user satisfaction and loyalty within e-procurement environments

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