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Ease of use, user satisfaction, and net benefits: evidence from digital customs platforms in free trade zones

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ABSTRACT

The digital transformation implemented by the Directorate General of Customs and Excise (DGCE) through the adoption of CEISA 4.0 aims to enhance efficiency, responsiveness, and reliability in customs services, including at operational units within the Free Trade Zone (FTZ). However, recurring issues such as system downtime, document validation failures, and access difficulties indicate a gap between user expectations and the net benefit of the system. This study aims to analyze the influence of perceived ease of use on user satisfaction and the net benefit of the CEISA 4.0 application among service users in the FTZ. A quantitative approach was employed using PLS-SEM via SmartPLS v4.2.9. A purposive sampling technique was applied to CEISA 4.0 service users in the FTZ areas of Batam, Bintan, Karimun, and Sabang. All constructs demonstrated adequate reliability and validity (Cronbach's Alpha 0.847–0.931; Composite Reliability 0.897–0.946; AVE 0.686–0.748). Data were collected through a Likert 1–5 scale questionnaire distributed to CEISA 4.0 service users in the Free Trade Zone. The theoretical framework integrates the Technology Acceptance Model (TAM) and the DeLone & McLean IS Success Model. Results indicate that: (1) perceived ease of use has a significant positive effect on user satisfaction ($\beta = 0.649$; $p < 0.05$); (2) user satisfaction has a significant positive effect on net benefit ($\beta = 0.442$; $p < 0.05$); (3) perceived ease of use has a direct significant positive effect on net benefit ($\beta = 0.229$; $p < 0.05$); and (4) user satisfaction significantly mediates the effect of perceived ease of use on net benefit ($\beta = 0.287$; $p < 0.05$). These findings underscore that improving ease of use of CEISA 4.0 is a strategic key to enhancing user satisfaction and net benefit of digital customs services in FTZ.

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Introduction

Digital transformation in public administration has become a strategic agenda in many countries, including Indonesia. The Directorate General of Customs and Excise (DGCE), as a public institution that plays a crucial role in managing the flow of goods, international trade, and state revenue, has developed the Customs-Excise Information System and Automation (CEISA) as an integrated digital service system. The latest version, CEISA 4.0, which has been under development since 2019 and gradually implemented in full (mandatory) across various offices, is designed to integrate all customs and excise processes electronically, including the Free Trade Zone (FTZ) service modules (Rahmi et al., 2025) .

A Free Trade Zone (FTZ), or Free Trade and Free Port Zone, refers to a designated area separated from the customs territory, exempt from import duties, value-added tax (VAT), luxury goods sales tax, and excise. FTZ areas in Indonesia, including Batam, Bintan, Karimun, and Sabang, are established under specific legal frameworks governing free trade zones. With the increasing volume of logistics and trade activities in FTZ areas, the use of CEISA 4.0 has become increasingly critical. The Decree of the Director General of Customs and Excise Number KEP-269/BC/2024 mandates that operational units within FTZ areas utilize the PPFTZ-02 and PPFTZ-03 modules in the CEISA 4.0 application, marking the seventeenth phase of mandatory implementation (Gurung et al., 2024) .

However, data from the DGCE Performance Report (2025) indicate that the ICT system downtime rate has shown an increasing trend, rising from 0.0076% in 2023 to 0.0280% in 2024—representing a significant increase of 0.0204%. Various technical issues have been reported in CEISA 4.0, including public access failures due to database restarts, delays in the submission of import and export declaration documents (PIB and PEB), validation issues in export documents (affecting 1,462 documents in April 2024), as well as failures in portal features and production deployment (Ministry of Finance DGCE, 2025) . Although the observed increase remains below 0.03%, even marginal downtime in a mandatory, single-gateway customs system carries outsized operational risk, since PIB/PEB submission delays and validation failures directly disrupt time-sensitive export–import processes rather than representing a statistically negligible fluctuation

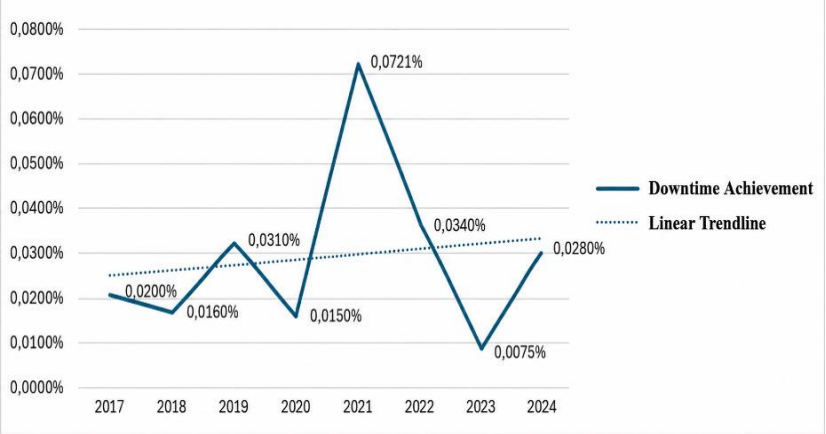

Figure 1. ICT System Downtime Trend 2017–2024
Source: DGCE Performance Report, 2025

As illustrated in the figure above, the ICT system downtime trend fluctuates but demonstrates an overall upward trajectory over time, indicating recurring issues related to the reliability and stability of CEISA 4.0. This condition directly affects service effectiveness, slows down export-import processes, and potentially reduces user satisfaction and perceived net benefits (DeLone & McLean, 2003; Varastika et al., 2025).

These issues highlight the need for an empirical study examining the factors influencing the success of CEISA 4.0, particularly from the perspective of service users in FTZ areas. Previous studies have demonstrated that perceived ease of use (PEOU) significantly influences user satisfaction and continued system usage (Filieri et al., 2021; Gao et al., 2018; Al-Adwan et al., 2023). Unlike prior TAM–DeLone and McLean integrations conducted in banking or general e-government contexts, this study addresses a mandatory (non-voluntary) customs platform, where usage compulsion may alter the ease of use–satisfaction relationship in ways not yet examined empirically. Furthermore, user satisfaction has been identified as a key variable in determining the success of public information systems (Ruangkanjanases & Hariguna, 2025; Rahmatullah et al., 2025).

Based on this background, this study aims to analyze: (1) the effect of perceived ease of use on user satisfaction of CEISA 4.0; (2) the effect of user satisfaction on net benefits; (3) the direct effect of perceived ease of use on net benefits; and (4) the mediating role of user satisfaction in the relationship between perceived ease of use and the net benefits of the CEISA 4.0 application in FTZ areas. This study integrates the Technology Acceptance Model (TAM) and the DeLone and McLean IS Success Model as its theoretical framework.

Table1. List of Mandatory CEISA 4.0 Phase Seventeen Offices

Office Name	Location	Description
KPPBC TMP B Batam	Batam, Riau Islands	FTZ Batam — PPFTZ-02 & PPFTZ-03 Modules
KPPBC TMP B Tanjung Balai Karimun	Karimun, Riau Islands	FTZ Karimun — PPFTZ-02 & PPFTZ-03 Modules
KPPBC TMP B Tanjung Pinang	Bintan, Riau Islands	FTZ Bintan — PPFTZ-02 & PPFTZ-03 Modules
KPPBC TMP C Sabang	Sabang, Aceh	FTZ Sabang — PPFTZ-02 & PPFTZ-03 Modules

Source: Decree of the Director General of Customs and Excise Number KEP-269/BC/2024

Table 1 presents the Customs and Excise offices mandated to implement the PPFTZ-02 and PPFTZ-03 modules in CEISA 4.0 based on Decree KEP-269/BC/2024. These four offices represent all FTZ areas in Indonesia—Batam, Karimun, Bintan, and Sabang—which constitute the population and context of this study.

Method

Research Design and Approach

This study adopts a quantitative approach with a causal research design, specifically explanatory research. The underlying paradigm is positivist, employing a deductive approach that begins with the Technology Acceptance Model (TAM) and the DeLone and McLean IS Success Model, which are subsequently translated into empirically testable hypotheses (Rahmatullah et al., 2025). While the cross-sectional design limits strict causal inference, the explanatory approach here is used in the PLS-SEM tradition of testing theoretically pre-specified directional hypotheses rather than establishing temporal causality; this limitation is acknowledged in the Discussion section. The research strategy utilized is a cross-sectional survey, in which data are collected at a single point in time from respondents who are users of the CEISA 4.0 application within Free Trade Zone areas (Kala et al., 2025) .

Population and Sample

The population of this study comprises all CEISA 4.0 service users who utilize the Free Trade Zone modules (PPFTZ-02 and PPFTZ-03) in designated FTZ areas where system usage is mandatory, including importers, exporters, customs brokerage firms (PPJK), and carriers operating in Batam, Bintan, Karimun, and Sabang. The sampling technique employed is purposive sampling, based on the criteria that respondents must have used the CEISA 4.0 application and have experience with the Free Trade Zone modules within the system. The determination of sample size follows the minimum sample requirement in PLS-SEM, which suggests at least ten times the largest number of indicators used in the model (Hair et al., 2021; Memon et al., 2020). With a total of 15 indicators, the minimum required sample size is 150 respondents.

Operationalization of Variables

This study involves three primary variables: (1) The independent variable (X), Perceived Ease of Use (PEOU), measured using six indicators adapted from Legramante et al. (2023) and Davis (1989); (2) the mediating variable (Z), User Satisfaction, measured using five indicators from Varastika et al. (2025); and (3) the dependent variable (Y), Net Benefit, measured using four indicators derived from DeLone & McLean (2003), Suardika et al. (2024), and Rahmatullah et al. (2025). All indicators are measured using a five-point Likert scale ranging from strongly disagree to strongly agree. All indicator items were adapted from previously validated instruments (Legramante et al., 2023; Davis, 1989; Varastika et al., 2025; DeLone & McLean, 2003), and their reliability in this study was confirmed through Cronbach's Alpha and Composite Reliability testing reported in Table 5.

Table 2. Operationalization of Research Variables

Variable	Dimension/Indicator	Item	Source
Ease of Use (X)	Easy to learn	KMP1	Davis (1989); Legramante et al. (2023)
	Easy to understand	KMP2	
	Free from difficulty/errors	KMP3	
	Flexible	KMP4	
	Ease of achieving objectives	KMP5	
	Ease of operation	KMP6	
User Satisfaction (Z)	System quality	KPP1	Varastika et al. (2025)

Variable	Dimension/Indicator	Item	Source
	Information quality	KPP2	
	Service quality	KPP3	
	System use	KPP4	
	Perceived usefulness	KPP5	
Net Benefits (Y)	Productivity	MB1	DeLone & McLean (2003); Rahmatullah et al. (2025)
	Speed of Accomplishing Task	MB2	
	Usefulness	MB3	
	Effectiveness	MB4	

Source: Author, 2025 (adapted from various sources)

Table 2 presents the operationalization of the research variables. Each indicator is adapted from previously validated research instruments and adjusted to reflect the context of the CEISA 4.0 application in Free Trade Zone areas. Perceived ease of use is measured through six indicators that encompass aspects of learnability, understandability, freedom from difficulty, flexibility, ease of achieving objectives, and operational simplicity of the system (Silvestro et al., 2024) .

Measurement Scale

Illustrates the five-point Likert scale employed in the questionnaire instrument. This scale is selected due to its effectiveness in capturing perceptions, attitudes, and subjective evaluations of users in a structured manner that can be analyzed statistically.

Table 3. Likert Scale Used

Code	Description	Score
STS	Strongly Disagree	1
TS	Disagree	2
N	Neutral	3
S	Agree	4
SS	Strongly Agree	5

Source: Adapted from Simamora (2022)

Data Analysis Technique

Data analysis is conducted using Structural Equation Modeling Partial Least Squares (SEM-PLS) with SmartPLS version 4.2.9. This method is chosen for its capability to simultaneously estimate path models involving latent variables and mediation effects (Hair et al., 2021). The analysis is performed in two stages: evaluation of the outer model, which includes tests of convergent validity using loading factors and Average Variance Extracted (AVE), discriminant validity using the HTMT ratio, and reliability assessment using Cronbach's Alpha and Composite Reliability (CR); and evaluation of the inner model, which includes R-square, F-square as a measure of effect size, Predictive Relevance (Q-square), and hypothesis testing through bootstrapping with criteria of p-values below 0.05 and t-statistics greater than 1.960 at a 5 percent significance level.

Research Hypotheses

Based on the theoretical framework and prior studies, the hypotheses of this study are formulated as follows:

H1: Perceived ease of use has a positive and significant effect on user satisfaction.

H2: User satisfaction has a positive and significant effect on net benefit.

H3: Perceived ease of use has a positive and significant direct effect on net benefit.

H4: Perceived ease of use has a positive effect on net benefit through the mediating role of user satisfaction.

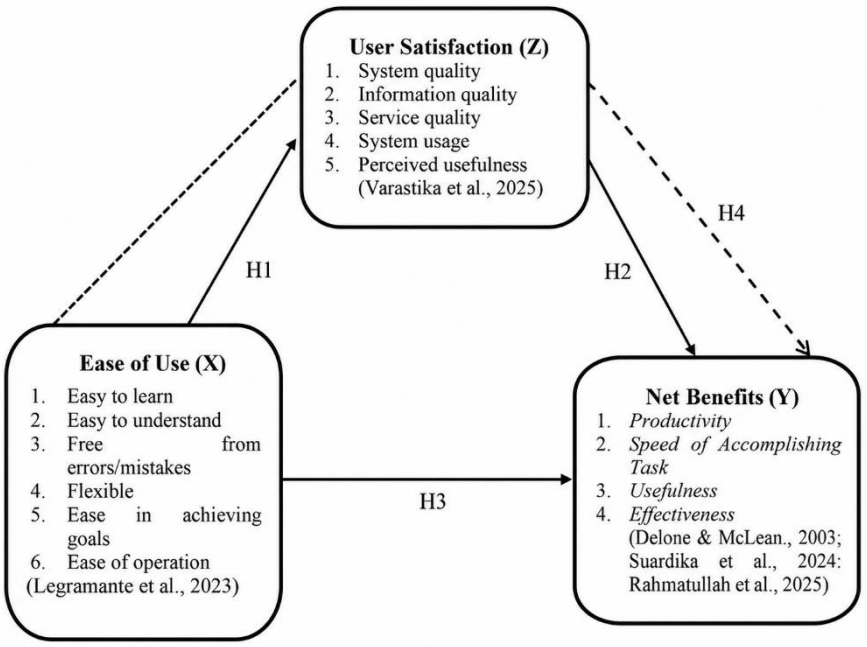

Figure 2. Research Framework
Source: Author, 2025

Figure 2 illustrates the research framework, depicting the relationships among variables. Perceived ease of use (X) exerts a direct effect on net benefit (Y) and an indirect effect through the mediation of user satisfaction (Z). This model integrates TAM, which explains the influence of perceived ease of use on satisfaction, and the DeLone and McLean IS Success Model, which explains the impact of satisfaction on net benefit.

RESULTS AND DISCUSSION

Outer Model Evaluation

The outer model evaluation is conducted to assess the validity and reliability of the measurement instruments. Convergent validity is examined through loading factors and Average Variance Extracted values for each construct, while reliability is assessed using Cronbach's Alpha and Composite Reliability.

Table 4. Convergent Validity Test Results

Indicator	Loading Factor	Description
KMP1 – Easy to learn	0,839	Valid (> 0,70)
KMP2 – Easy to understand	0,869	Valid (> 0,70)
KMP3 – Free from difficulty/errors	0,882	Valid (> 0,70)
KMP4 – Flexible	0,885	Valid (> 0,70)
KMP5 – Ease of achieving objectives	0,850	Valid (> 0,70)
KMP6 – Ease of operation	0,882	Valid (> 0,70)
KPP1 – System quality	0,796	Valid (> 0,70)
KPP2 – Information quality	0,838	Valid (> 0,70)
KPP3 – Service quality	0,860	Valid (> 0,70)
KPP4 – System usage	0,869	Valid (> 0,70)
KPP5 – Perceived usefulness	0,826	Valid (> 0,70)
MB1 – Productivity	0,793	Valid (> 0,70)
MB2 – Speed of Accomplishing Task	0,848	Valid (> 0,70)
MB3 – Usefulness	0,864	Valid (> 0,70)
MB4 – Effectiveness	0,821	Valid (> 0,70)

Source: SmartPLS Output Version 4.2.9, 2025

Table 4 indicates that all research indicators have loading factor values exceeding 0.70, which meets the minimum threshold for convergent validity in PLS-SEM (Hair et al., 2021). The highest loading factors are observed in indicator KMP4 (flexibility) at 0.885 and KMP3 (freedom from difficulty or error) at 0.882, suggesting that these aspects most strongly represent the perceived ease of use construct.

Table 5. Reliability and AVE Test Results

Variable	Cronbach's Alpha	Composite Reliability (CR)
Ease of Use (KMP)	0,931	0,946
User Satisfaction (KPP)	0,899	0,923
Net Benefits (MB)	0,847	0,897

Source: SmartPLS Output Version 4.2.9, 2025

Table 5 shows that all variables exhibit Cronbach's Alpha and Composite Reliability values above 0.70, indicating satisfactory reliability. Additionally, the AVE values for all constructs exceed 0.50, confirming adequate convergent validity. The perceived ease of use variable demonstrates the highest reliability with a Composite Reliability value of 0.946, reflecting excellent internal consistency of the measurement instrument.

Table 6. Discriminant Validity Test Results (HTMT Ratio)

Variable	Ease of Use	User Satisfaction	Net Benefits
Ease of Use	-	-	-
User Satisfaction	0,741	-	-
Net Benefits	0,607	0,709	-

Source: SmartPLS Output Version 4.2.9, 2025

The Heterotrait-Monotrait Ratio values presented in Table 6 are all below 0.90, indicating that the constructs in the research model achieve satisfactory discriminant validity. Collectively, these outer model results confirm that the adapted TAM and DeLone–McLean instruments retain strong psychometric properties even when applied to a mandatory government platform, extending prior validation evidence from Legramante et al. (2023) and Varastika et al. (2025) to the customs administration context.

Inner Model Evaluation

Presents the R-square value for User Satisfaction at 0.421, indicating that perceived ease of use explains 42.1 percent of the variance in user satisfaction, while the remaining 57.9 percent is explained by other variables outside the model. Meanwhile, the R-square value for Net Benefit is 0.379, suggesting that perceived ease of use and user satisfaction jointly explain 37.9 percent of its variance.

Table 7. R-Square Test Results

Variable Endogen	R-Square	R-Square Adjusted	Category
User Satisfaction (Z)	0,421	0,417	Moderate
Net Benefits (Y)	0,379	0,371	Moderate

Source: SmartPLS Output Version 4.2.9, 2025

Table 8. F-Square Test Results (Effect Size)

Ease of Use → User Satisfaction	0,727	Strong (> 0,35)
Ease of Use → Net Benefits	0,049	Weak (0,02–0,15)
User Satisfaction → Net Benefits	0,182	Medium (0,15–0,35)

Source: SmartPLS Output Version 4.2.9, 2025

Table 8 illustrates the effect size of each relationship within the model. The effect of perceived ease of use on user satisfaction is categorized as strong with an f-square value of 0.727, indicating that perceived ease of use is a dominant factor in shaping user satisfaction with CEISA 4.0. The effect of user satisfaction on net benefit falls within the moderate category with an f-square value of 0.182, whereas the direct effect of perceived ease of use on net benefit is considered weak with an f-square value of 0.049.

Table 9. Predictive Relevance Test Results (Q-Square)

Variable Endogen	Q^2 (= 1 – SSE/SSO)	Description
User Satisfaction	0,241	Has predictive relevance (> 0)
Net Benefits	0,222	Has predictive relevance (> 0)

Source: SmartPLS Output Version 4.2.9, 2025

Table 9 shows that the Q-square values for both endogenous variables are above zero, indicating that the model has adequate predictive relevance and good observational capability in explaining user satisfaction and net benefit.

Hypothesis Testing Results

Presents the structural model visualization based on PLS-SEM bootstrapping results, illustrating the path coefficients and corresponding t-statistics among variables. All tested paths demonstrate t-statistic values greater than 1.960, indicating statistical significance at the 5 percent level.

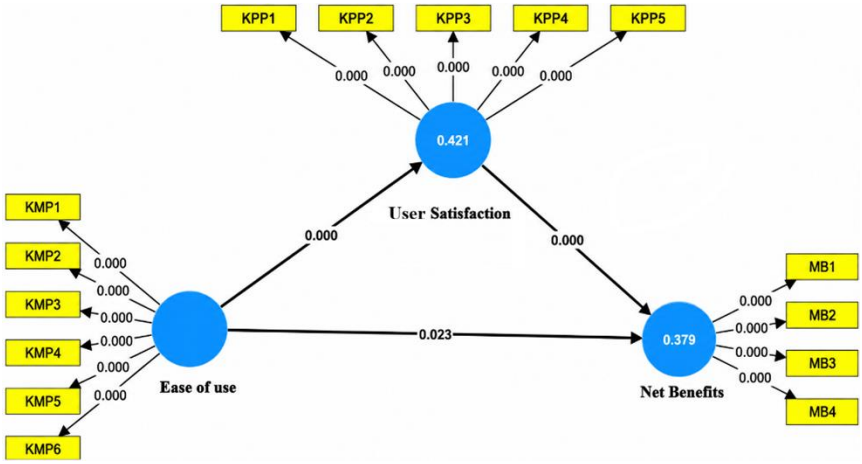

Figure 3. Hypothesis Testing Model (PLS-SEM Bootstrapping)
Source: SmartPLS Output Version 4.2.9, 2025

Table 10. Hypothesis Testing Results

Variable	Original Sample (O)	T Statistic (| O/STDEV |)	P Values
Ease of Use -> User Satisfaction	0,649	6,713	0,000
User Satisfaction -> Net Benefits	0,442	5,292	0,000
Ease of Use -> Net Benefits	0,229	2,278	0,023
Ease of Use -> User Satisfaction -> Net Benefits	0,287	3,510	0,000

Source: SmartPLS Output Version 4.2.9, 2025; Description: KMP = Ease of Use; KPP = User Satisfaction; MB = Net Benefits

The bootstrapping results using SmartPLS version 4.2.9 reveal that perceived ease of use has a positive and significant effect on user satisfaction. This is evidenced by a path coefficient of 0.649, a p-value of 0.000, and a t-statistic of 6.713. Therefore, the hypothesis stating that perceived ease of use positively and significantly influences user satisfaction is supported. Furthermore, the results indicate that user satisfaction has a positive and significant effect on net benefit, with a coefficient of 0.442, a p-value of 0.000, and a t-statistic of 5.292. Accordingly, the hypothesis regarding the positive and significant effect of user satisfaction on net benefit is accepted. The findings also show that perceived ease of use has a positive and significant direct effect on net benefit, with a coefficient of 0.229, a p-value of 0.023, and a t-statistic of 2.278. This indicates that higher levels of perceived ease of use lead to greater net benefits experienced by users. Thus, the hypothesis concerning the direct positive effect of perceived ease of use on net benefit is supported.

In addition to the direct effects, this study identifies a significant indirect effect of perceived ease of use on net benefit through user satisfaction. The results show a coefficient of 0.287, a p-value of 0.000, and a t-statistic of 3.510, confirming that user satisfaction mediates the relationship between perceived ease of use and net benefit. Therefore, the mediation hypothesis is accepted.

The Effect of Perceived Ease of Use on User Satisfaction

the results of the first hypothesis (H1) testing indicate that perceived ease of use has a positive and significant effect on user satisfaction, with a coefficient value of $\beta = 0.649$, t-statistic = 6.713 greater than 1.960, and p-value = 0.000 less than 0.05. With a strong effect size ($f^2 = 0.727$), this finding confirms that perceived ease of use serves as a dominant predictor of user satisfaction with CEISA 4.0.

In the context of technological advancement, an application is considered to possess high quality when it effectively assists users and is easy to operate. Ease of use enables users to complete tasks more efficiently,

thereby saving time that can be allocated to other activities (Prasetio et al, 2024). Such convenience constitutes a critical factor that fosters user satisfaction.

This finding is consistent with Fajriyah (2024), who reported that perceived ease of use positively influences user satisfaction in the context of the BWS mobile banking application. Similarly, Mogaji et al. (2024) emphasize that despite the challenges introduced by the era of generative technology, ease of use remains a critical determinant of system adoption and user satisfaction. It is also plausible that the dominant effect of ease of use in this study is amplified by the mandatory nature of CEISA 4.0 adoption: unlike voluntary platforms where users can switch to alternatives, FTZ service users have no substitute system, which may compound the salience of usability barriers rather than reflecting a universally stronger ease-of-use effect (Rahman & Harianto, 2023) . From a practical perspective, these findings imply that the Directorate General of Customs and Excise should prioritize interface simplification, system responsiveness, and the reduction of technical barriers within CEISA 4.0 to enhance user satisfaction (Al Adwan et al., 2023; Febrianti, Latief, & Dirwan, 2025).

The Effect of User Satisfaction on Net Benefits

The results of the second hypothesis (H2) testing show that user satisfaction has a positive and significant effect on net benefits, with a coefficient value of $\beta = 0.442$, t-statistic = 5.292 greater than 1.960, and p-value = 0.000 less than 0.05. The effect size is categorized as moderate ($f^2 = 0.182$), indicating that user satisfaction is a significant predictor, although not the sole determinant, of net benefits.

Net benefits reflect the impact of information systems on user behavior as well as their contribution to organizational effectiveness in improving communication and information utilization (Saputri et al, 2024). Users who experience satisfaction tend to develop trust in the technology and perceive tangible benefits from its use. Satisfied users are more likely to increase system usage, which in turn leads to enhanced performance, time and cost efficiency, and improved decision making (Yuniarti et al., 2021).

These findings are aligned with the DeLone & McLean (2003) model, which identifies user satisfaction as a direct antecedent of net benefits. Empirical evidence from Varastika et al. (2025) in the context of the M-Paspor application in Indonesia also confirms the significant influence of user satisfaction on system benefits. Similarly, Rahmatullah et al. (2021) report a positive and significant relationship between user satisfaction and net benefits in e-government systems in Indonesia.

The Direct Effect of Perceived Ease of Use on Net Benefits

The results of the third hypothesis (H3) testing indicate that perceived ease of use has a positive and significant direct effect on net benefits, with a coefficient value of $\beta = 0.229$, t-statistic = 2.278 greater than 1.960, and p-value = 0.023 less than 0.05. Although this direct effect is relatively weak ($f^2 = 0.049$), it remains statistically significant.

Ease of use constitutes an important factor influencing the net benefits perceived by users. Net benefits represent the extent to which users experience positive outcomes from utilizing a particular technology (Yuniarti et al., 2021). Users generally expect that a system will be easy to operate so that it can support task execution and generate positive impacts (Jaleta & Tulu, 2023) .

A system that is easy to use tends to increase usage intensity due to improvements in time efficiency and performance. When users perceive a system as beneficial, easy to use, and capable of supporting decision making in a practical manner, their satisfaction increases, which ultimately contributes to higher net benefits (Aghiesna et al. 2025).

The Mediating Role of User Satisfaction

The results of the fourth hypothesis (H4) testing demonstrate that user satisfaction significantly mediates the effect of perceived ease of use on net benefits, with a coefficient value of $\beta = 0.287$, t-statistic = 3.510 greater than 1.960, and p-value = 0.000 less than 0.05. By comparing the direct effect ($\beta = 0.229$) and the indirect effect through mediation ($\beta = 0.287$), it can be concluded that user satisfaction functions as a partial mediator in the relationship between perceived ease of use and net benefits.

In the contemporary era, rapid technological advancement has increased the demand for systems that enable users to perform activities efficiently and save time (Saputri et al. 2024). Technologies that are easy to use not only provide functional support but also enhance user satisfaction and potentially increase perceived net benefits. User satisfaction is crucial, as it plays a significant role in the development and sustainability of a system or technology (Syahfitri, Trisnawati, & Ahyani, 2022).

These findings are consistent with Syahfitri et al. (2022), who found that user satisfaction mediates the relationship between system quality and net benefits. The practical implication of this study is that the most

effective strategy to enhance the net benefits of CEISA 4.0 is to first improve the system's ease of use, which subsequently increases user satisfaction and ultimately leads to greater overall benefits.

This study is subject to several limitations. First, the cross-sectional design captures perceptions at a single point in time and therefore cannot establish strict causal ordering among perceived ease of use, user satisfaction, and net benefits. Second, the purposive sampling strategy, while appropriate for a mandatory-user population, may introduce selection bias and limits statistical generalizability beyond the four FTZ offices studied. Third, data reliance on self-reported Likert-scale responses raises the possibility of common method bias. Future research employing longitudinal or mixed-method designs, probability sampling where feasible, and multi-source data would help address these constraints.

Conclusions

In conclusion, this paper proves that perceived ease of use is a strategic factor for achieving higher levels of user satisfaction and net benefits in CEISA 4.0. Its indirect effect is stronger compared to the direct one, as it operates through user satisfaction. Moreover, it is established that perceived ease of use has a direct positive impact on net benefits, thus supporting the partial mediation hypothesis of user satisfaction between perceived ease of use and net benefits in the integrated Technology Acceptance Model (TAM) and DeLone and McLean Information Systems Success framework. The conclusions achieved in the study address the posed research objectives, namely (1) the impact of ease of use on user satisfaction; (2) the relationship of user satisfaction and net benefits; and (3) the greater strength of the mediated pathway compared to the direct one. The result of the analysis implies that interface usability improvement is insufficient for reaping full benefits unless it helps achieve user satisfaction. Besides, the conclusions provide further proof of applicability of the integrated TAM-DeLone and McLean information system success framework to mandatory public-sector information systems. Namely, the success of digital government initiatives depends not only on the effectiveness of the implemented system but also on the ease of use and user satisfaction. Taking into account the nature of the study design and sampling methods used in the research, discussed above conclusions can be viewed as evidence of associations found within FTZ offices rather than causal relations, which can be generalized across other settings. In practice, the Directorate General of Customs and Excise needs to focus on the improvement of the interface usability, system stability, response time of servers and sufficient user assistance provided during usage of the PPFTZ-02 and PPFTZ-03 modules. In addition to that, user satisfaction needs to be included in the assessment of the digital transformation progress. Future research could include further elaboration of the presented model, including more antecedent factors such as system quality, information quality, perceived usefulness, user trust and facilitating conditions, ideally using longitudinal or mixed designs and probability-based sampling methods.

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