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The Effect of Perceived Ease of Use and Perceived Usefulness on User Satisfaction with the CEISA 4.0 System at KPPBC TMP B Bandar Lampung

(*Pengaruh Persepsi Kemudahan Penggunaan dan Persepsi Kegunaan terhadap Kepuasan Pengguna Sistem CEISA 4.0 pada KPPBC TMP B Bandar Lampung*)

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Abstract: The Directorate General of Customs and Excise (DJBC) developed the Customs Excise Information System and Automation (CEISA) 4.0 as an integrated, web-based successor to the earlier modular CEISA application, intended to provide real-time, integrated customs and excise services (Rahmi et al. 2025; Sudarmadi et al. 2022). Although the Service User Satisfaction Survey (SKPJ) at KPPBC Type Madya Pabean (TMP) B Bandar Lampung for the 2023-2025 period remained in the "very good" category, nearly all service indicators declined year on year, and thousands of CEISA CARE tickets continued to be logged both nationally and at the unit level, indicating that improvements in system technology have not automatically translated into a better user experience.

Objective: This article aims to analyze the partial and simultaneous effects of perceived ease of use and perceived usefulness on user satisfaction with the CEISA 4.0 system, and to measure the level of user satisfaction using the System Usability Scale (SUS), at KPPBC TMP B Bandar Lampung.

Methodology: This is an explanatory quantitative study on external users of CEISA 4.0 (importers/exporters, bonded storage operators, customs brokers, transportation service providers, and excise service users).

From a population of 794 users, a sampling frame of 418 eligible users was formed through purposive sampling, from which a Slovin-based proportionate stratified random sample was drawn; an online questionnaire (Google Form) ultimately produced 91 valid responses. Data were analyzed using validity and reliability tests, classical assumption tests, multiple linear regression, partial (t) and simultaneous (F) hypothesis tests at the 5% significance level, and SUS scoring.
Research Results: Perceived ease of use (t = 5.475; Sig. = 0.000) and perceived usefulness (t = 5.448; Sig. = 0.000) each have a positive and significant partial effect on user satisfaction, and jointly have a significant simultaneous effect (F = 47.935; Sig. = 0.000), together explaining 51.1% of the variance in user satisfaction (Adjusted R^2 = 0.511). The SUS analysis produced a mean score of 74.45, placing CEISA 4.0 in the Acceptable category with Grade B and an overall "Good" adjective rating, although 49.5% of respondents still rated the system as only Marginal.

Keywords: Perceived Ease of Use, Perceived Usefulness, User Satisfaction, System Usability Scale, CEISA 4.0

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1. Introduction

In carrying out customs and excise services, the Directorate General of Customs and Excise (DJBC) faces business processes that are complex, dynamic, and involve a wide range of stakeholders, particularly businesses and other service users (Sudarmadi et al. 2022). This complexity demands an information system capable of presenting data accurately, quickly, consistently, and in an integrated manner, since any error or delay in information management has the potential to disrupt the flow of goods, state revenue optimization, and public trust in the quality of government services.

To address this need, DJBC developed the Customs Excise Information System and Automation (CEISA) 4.0 as an enhancement of the earlier, still-modular CEISA

application. CEISA 4.0 is an integrated, web-based system that enables real-time data access for users (Rahmi et al. 2025; Sudarmadi et al. 2022). The system was developed to integrate various customs and excise business processes into a single platform in order to improve operational efficiency, maintain data consistency, and improve the overall quality of public service (DeLone and McLean 2003; Kusuma and Zahra 2025). Theoretically, under the Information System Success Model (ISSM) proposed by (DeLone and McLean 2003), the success of an information system is determined by system quality, information quality, and service quality, which subsequently affect user satisfaction; the success of a system implementation is therefore not determined solely by the sophistication of the technology, but also by the extent to which the system meets user needs and expectations.

The development of information technology has driven a fundamental shift in public service delivery, from a process-oriented toward a user-oriented paradigm, positioning integrated information systems as strategic instruments supporting bureaucratic reform, efficiency, effectiveness, transparency, and accountability (World Bank 2021).

Data from the Service User Satisfaction Survey (SKPJ) at KPPBC TMP B Bandar Lampung for the 2023-2025 period show that, although overall satisfaction remained in the "very good" category, there was a declining trend across the observation period. In 2024 the satisfaction index reached 3.686 ("Very Satisfied"), yet every indicator declined compared with the previous year, most notably service-officer speed (-0.279), toilet comfort (-0.251), availability of other supporting facilities (-0.251), office cleanliness (-0.223), and ease of service procedures (-0.222); indicators directly related to the administrative system, such as clarity of administrative requirements (-0.195), clarity of service costs (-0.195), and service time (-0.194), also declined. The same tendency persisted in 2025, when the unit satisfaction index stood at 91.90 ("Very Good"), equivalent to 3.676 on the same scale as the previous surveys, with service time (3.56), service procedures (3.71), and service facilities (3.67) receiving relatively lower scores than other elements.

This pattern is consistent with CEISA 4.0 operational data, which show that technical issues persist in practice. Nationally, since the launch of the CEISA CARE service in 2024 through the end of 2025, 51,802 service tickets were logged, dominated by reports of system disruption, application errors (bugs), and access or processing constraints. At the unit level, KPPBC TMP B Bandar Lampung received 2,373 tickets between September 2024 and December 2025, of which 2,365 (99.79%) were resolved, mostly within 5-30 minutes (27.32%). Although the resolution rate is very high, the sheer volume of tickets indicates that users continue to encounter operational obstacles, suggesting that improvements in system technology have not fully eliminated the difficulties users experience, and that user experience remains vulnerable to technical and operational issues that arise during use.

From the perspective of the Technology Acceptance Model (TAM), (Davis 1989) explains that technology acceptance is shaped by two central constructs: perceived ease of use and perceived usefulness. Perceived ease of use reflects a user's belief that operating a system requires little effort, while perceived usefulness reflects the belief that a system improves the effectiveness, efficiency, and performance of one's work. Subsequent research indicates that these two constructs not only shape the intention to use technology but also contribute to user satisfaction as an evaluation of the overall experience of using a system (Kim 2024); accordingly, perceptions of ease of use and usefulness are strong determinants of how users judge the quality of an information system (Kusuma and Zahra 2025; Sebayang and Tarigan 2009). In the implementation of CEISA 4.0, these two perceptions matter directly, since the system directly supports customs and excise service processes: if users find the system difficult to operate, the procedures overly complex, or the benefits insufficient to support the optimal completion of their work, user satisfaction is likely to decline.

Prior empirical studies support this relationship. (Alamsyah et al. 2023) found that perceived ease of use and perceived usefulness significantly affect information-system user satisfaction; (Kala et al. 2024) found that system and service quality shape perceived usefulness, which in turn improves user satisfaction; and (Rahman

and Harianto 2023), studying CEISA implementation, found that both perceptions play an important role in strengthening user acceptance.

Alongside the TAM-based literature, many studies of modern information-system satisfaction adopt the System Usability Scale (SUS) developed by (Brooke 1986), a usability-measurement instrument that comprehensively evaluates ease of use, system complexity, interface consistency, and user comfort (Brooke 1986; Zahratul et al. 2023). Applying SUS to CEISA 4.0, (Zahratul et al. 2023) found the system to be in the fairly good category, still requiring refinement in several respects, while similar conclusions were reached by (Bilung et al. 2023) and (Ardhana 2022) for other public information systems.

Nevertheless, most SUS-based studies focus on measuring usability or satisfaction levels without examining the antecedents that shape them, while TAM-based studies tend to emphasize technology acceptance and usage intention rather than usability-based satisfaction measurement. This indicates a research gap: studies analyzing the effect of perceived ease of use and perceived usefulness on user satisfaction as measured through the System Usability Scale (SUS), specifically for CEISA 4.0 implementation, remain limited.

Based on this gap, the present study analyzes the effect of perceived ease of use and perceived usefulness on user satisfaction with the CEISA 4.0 system at KPPBC TMP B Bandar Lampung by integrating the Technology Acceptance Model (TAM) and the System Usability Scale (SUS), with the aim of providing a more comprehensive understanding of the factors shaping user satisfaction as a basis for improving the quality of the customs and excise information service system. Specifically, this article aims to (1) analyze the effect of perceived ease of use on user satisfaction with CEISA 4.0; (2) analyze the effect of perceived usefulness on user satisfaction with CEISA 4.0; (3) analyze the simultaneous effect of perceived ease of use and perceived usefulness on user satisfaction with CEISA 4.0; and (4) measure the level of user satisfaction with CEISA 4.0 using the SUS method at KPPBC TMP B Bandar Lampung.

2. Research Method

This article is based on quantitative research using an explanatory approach, chosen because the study does not merely describe a phenomenon but also tests the causal relationships among variables through hypothesis testing based on empirical data obtained from CEISA 4.0 users (Sugiyono 2022). Data were collected through a structured questionnaire survey distributed to CEISA 4.0 users at KPPBC TMP B Bandar Lampung, and analyzed using multiple linear regression to determine the partial and simultaneous effects of the independent variables on the dependent variable (Sembiring et al. 2024).

Data sources comprise primary data, obtained directly from respondents through a structured questionnaire distributed to CEISA 4.0 external users at KPPBC TMP B Bandar Lampung and used to test the research hypotheses (Darwin et al. 2021), and secondary data obtained from DJBC internal documents, CEISA operational reports, relevant regulations and policies, and prior scientific literature, used to strengthen the theoretical foundation and enrich the discussion (Syahza 2021; Sugiyono 2022).

The population comprises all 794 external service users of CEISA 4.0 at KPPBC TMP B Bandar Lampung, consisting of importers and exporters (441), bonded storage operators (TPB, 17), customs brokers (PPPJK, 87), transportation service providers (40), and excise service users (209). A purposive-sampling step was first applied to build the sampling frame, selecting users who (1) had used CEISA 4.0 in the customs and excise service process, (2) were active users not currently blocked, and (3) operated the system directly rather than through a PPJK representative.

Applying these criteria produced a sampling frame of 418 eligible users, as shown in Table 1. As the table shows, the reduction from 794 to 418 is concentrated almost entirely in the importer/exporter category: its initial population of 441 includes both enterprises that operate CEISA 4.0 directly and enterprises that transact through a PPJK intermediary, so applying the third criterion narrowed this category to the 65 importers/exporters who use the system directly. The other four categories-PPJK, transportation service providers, bonded storage operators, and excise service users-consist by definition of enterprises that operate their respective CEISA 4.0 modules

themselves, and therefore required no further exclusion under this criterion. The sampling frame is thus not an arbitrary subset of the population, but the set of users whose firsthand operational experience with the system makes them appropriate respondents for evaluating perceived ease of use and perceived usefulness. A proportionate stratified random sampling technique was then applied to this frame to obtain a representative, unbiased sample across the five user categories (Sugiyono 2022).

The minimum sample size was determined using Slovin's formula, $S = N / (N.d^2 + 1)$, with a population (N) of 418 and an error tolerance (d) of 10%, giving $S = 418 / (418 \times 0.1^2 + 1) = 80.69$, rounded up to 81 respondents, allocated proportionally across strata using $Ah = (Nh \times A) / N$ as summarized in Table 1.

In line with the recommendation that a survey's target sample be set above the statistically required minimum in order to anticipate non-response, incomplete returns, or other data-quality exclusions during collection (Cochran 1977; Israel 1992; Salant and Dillman 1994), the questionnaire was distributed online via Google Form to the entire sampling frame in each stratum rather than to a fixed list of exactly 81 pre-selected individuals. This approach allowed valid responses to accumulate beyond the calculated minimum before the collection period closed, ultimately yielding 91 valid, criteria-compliant responses (Table 2)-112.3% of the planned minimum of 81, or a margin of approximately 12%, within the 10-20% buffer range typically applied for self-administered online surveys under this literature (Salant and Dillman 1994). Because every additional response was independently verified against the same purposive-sampling criteria and passed data-completeness editing, none was added post hoc to compensate for a shortfall in a particular stratum; rather, the surplus reflects a deliberately unrestricted collection window designed to protect the study against the loss of usable cases to non-response or invalid returns, consistent with the sample-size-adjustment principle of n' = n / (1 - expected non-response rate) (Israel 1992). All 91 verified responses were therefore retained and used in the instrument-quality tests, regression analysis, and SUS analysis reported below, in place of relying solely on the bare statistical minimum.

Table 1. Initial Population, Sampling Frame, and Planned Sample Allocation

No	User Category	Initial Population	Population (Nh)	Sample Calculation	Planned Sample
1	Importers and Exporters	441	65	(65/418) × 81	13
2	Customs Brokers (PPJK)	87	87	(87/418) × 81	17
3	Transportation Service Providers	40	40	(40/418) × 81	8
4	Bonded Storage Operators (TPB)	17	17	(17/418) × 81	3
5	Excise Service Users	209	209	(209/418) × 81	40
	Total	794	418		81

Source: Tableau DJBC and CEISA 4.0, processed (2026).

As Table 2 shows, actual responses met or exceeded the planned allocation in four of the five categories, most notably bonded storage operators (233.3%) and importers/exporters (138.5%), while excise service users fell slightly short of their planned allocation (92.5%, or 37 of the planned 40). Even so, every stratum remained represented in the final dataset, and the overall achievement of 91 valid responses against a planned minimum of 81 (112.3%) indicates that the final sample satisfies, rather than departs from, the sample-size requirement established through Slovin's formula.

Table 2. Planned Sample and Actual Valid Responses by User Category

User Category	Planned Sample	Actual Valid Responses	Achievement (%)
Importers and Exporters	13	18	138.5
Customs Brokers (PPJK)	17	21	123.5
Transportation Service Providers	8	8	100.0
Bonded Storage Operators (TPB)	3	7	233.3
Excise Service Users	40	37	92.5
Total	81	91	112.3

Source: Primary Data, processed (2026).

Respondents' answers were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The perceived ease of use variable (X1) was measured using four indicators adapted from Hussain et al. (2025) in line with Davis (1989)-namely that the system is easy to learn, that interaction with the system is clear and understandable, that interaction with the system does not require much effort, and that the system is easy to use overall. The perceived usefulness variable (X2) was

measured using five indicators adapted from (Hussain et al. 2025) namely that the system improves performance, improves work effectiveness, provides benefits at work, helps users control their work, and that work becomes more difficult without the system. User satisfaction (Y) was measured using the ten-item System Usability Scale developed by (Brooke 1986), consisting of alternating positive- and negative-worded statements covering ease of use, complexity, need for technical assistance, feature functionality, consistency, learnability, and confidence in use; scores for each item were adjusted according to the standard SUS scoring procedure, summed, and multiplied by a conversion factor of 2.5 to yield a total score on a 0-100 scale, which was then interpreted using acceptability ranges, grade scale, and adjective ratings (Brooke 1986; Bangor 2009).

Data analysis was carried out with the aid of SPSS. Instrument quality was assessed through a Pearson product-moment validity test (an item is valid if r-count > r-table at the 5% significance level) and a Cronbach's Alpha reliability test (an instrument is reliable if Cronbach's Alpha > 0.70) (Sugiyono 2022; Hair et al. 2019). Classical assumption tests comprised the Kolmogorov-Smirnov normality test (data are normally distributed if Asymp. Sig. > 0.05), the Tolerance/Variance Inflation Factor (VIF) multicollinearity test (no multicollinearity if Tolerance > 0.10 and VIF < 10), and the Glejser heteroscedasticity test (no heteroscedasticity if Sig. > 0.05). The effects of perceived ease of use and perceived usefulness on user satisfaction were then examined using multiple linear regression and the coefficient of determination (R^2/Adjusted R^2), followed by hypothesis testing using the partial t-test and the simultaneous F-test at the 5% significance level. Finally, the overall level of user satisfaction with CEISA 4.0 was assessed through SUS score computation and categorization.

3. Result and Discussion

3.1 Overview of the Research Object

KPPBC TMP B Bandar Lampung is a technical implementation unit of DJBC responsible for customs and excise supervision and service in the Lampung region.

CEISA 4.0 is the integrated, web-based platform implemented at this office to replace earlier, modular CEISA applications, covering import-export, bonded storage, transportation, and excise-service modules. During the study period, several modules-particularly the excise module-were still undergoing phased implementation toward mandatory application, in accordance with the Director General of Customs and Excise Regulation Number PER-20/BC/2025 and the Director General of Customs and Excise Decree Number KEP-147/BC/2026, with full implementation scheduled to take effect on 30 June 2026. This transitional status is relevant to interpreting several of the findings discussed below.

3.2 Validity and Reliability Test Results

perceived usefulness, and user satisfaction instruments produced r-count values ranging from 0.367 to 0.894, all greater than the r-table value of 0.206 (N = 91; α = 5%) with a significance below 0.05, so that every item was declared valid. Reliability testing, summarized in Table 3, likewise showed that all three variables exceeded the 0.70 Cronbach's Alpha threshold, confirming that the instruments possess good internal consistency and are suitable for further analysis.

Table 3. Reliability Test Results

Variable	Cronbach's Alpha	N of Items	Category
Perceived Ease of Use (X1)	0.776	4	Acceptable / Reliable
Perceived Usefulness (X2)	0.880	5	Good / Reliable
User Satisfaction (Y)	0.705	10	Acceptable / Reliable

Source: Primary Data, processed (2026).

3.3 Instrument and Assumption Testing

The Kolmogorov-Smirnov normality test produced significance values above 0.05 for all three variables (0.197 for X1, 0.085 for X2, and 0.167 for Y), indicating normally distributed data. The multicollinearity test produced a Tolerance of 0.857 and a VIF of 1.166 for both X1 and X2, well within the accepted thresholds (Tolerance > 0.10; VIF < 10), indicating no multicollinearity between the independent variables. The Glejser heteroscedasticity test produced significance values of 0.182 for X1 and 0.160

for X2, both above 0.05, indicating no heteroscedasticity. Overall, the regression model satisfied all classical assumption requirements and was therefore suitable for multiple linear regression analysis.

Table 4. Summary of Classical Assumption Test Results

Test	Variable	Statistic	Value	Conclusion
Normality (Kolmogorov-Smirnov)	X1	Sig.	0.197	Normal
	X2	Sig.	0.085	Normal
	Y	Sig.	0.167	Normal
Multicollinearity	X1	Tolerance / VIF	0.857 / 1.166	No multicollinearity
	X2	Tolerance / VIF	0.857 / 1.166	No multicollinearity
Heteroscedasticity (Glejser)	X1	Sig.	0.182	No heteroscedasticity
	X2	Sig.	0.160	No heteroscedasticity

Source: Primary Data, processed (2026).

3.4 Multiple Linear Regression Analysis and Coefficient of Determination

Multiple linear regression was used to determine the direction and magnitude of the effect of perceived ease of use (X1) and perceived usefulness (X2) on user satisfaction (Y). The results, presented in Table 5, yield the regression equation Y = 23.751 + 0.589X1 + 0.499X2. The constant of 23.751 represents the baseline level of user satisfaction when both independent variables are held at zero. The regression coefficient of 0.589 for perceived ease of use indicates that each one-point increase in perceived ease of use raises the user-satisfaction score by 0.589 points, holding perceived usefulness constant, while the coefficient of 0.499 for perceived usefulness indicates that each one-point increase in perceived usefulness raises the user-satisfaction score by 0.499 points, holding perceived ease of use constant. Both coefficients are positive, indicating that increases in either perception are accompanied by increases in user satisfaction with CEISA 4.0.

Table 5. Multiple Linear Regression Results

Variable	B	Std. Error	Beta
Constant	23.751	1.850	-
Perceived Ease of Use (X1)	0.589	0.108	0.436
Perceived Usefulness (X2)	0.499	0.092	0.434

Source: Primary Data, processed (2026).

As shown in Table 6, the coefficient of determination yields R = 0.722, indicating a strong relationship between the two independent variables, taken together, and user satisfaction with CEISA 4.0. The R Square value of 0.521 indicates that 52.1% of the variance in user satisfaction can be explained by perceived ease of use and perceived usefulness, while the remaining 47.9% is explained by factors outside the model. Because the model uses two independent variables, the Adjusted R Square of 0.511 is the more appropriate reference, indicating that, after adjusting for the number of predictors and the sample size, the two variables jointly explain 51.1% of the variance in user satisfaction, with the remaining 48.9% attributable to factors not examined in this study, such as system quality, information quality, service quality, prior user experience, or organizational factors.

Table 6. Coefficient of Determination

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.722	0.521	0.511	2.91894

Source: Primary Data, processed (2026).

3.5 Hypothesis Testing

Hypothesis testing was carried out using the partial t-test and the simultaneous F-test at the 5% significance level. As shown in Table 7, perceived ease of use produced t = 5.475 with Sig. = 0.000 (< 0.05), so H1 is accepted: perceived ease of use has a positive and significant effect on user satisfaction with CEISA 4.0 at KPPBC TMP B Bandar Lampung. Perceived usefulness produced t = 5.448 with Sig. = 0.000 (< 0.05), so H2 is accepted: perceived usefulness has a positive and significant effect on user satisfaction. Both independent variables are therefore shown to have a positive and significant partial effect on user satisfaction.

Table 7. Partial Test (t-Test) Results

Variable	t	Sig.	Conclusion
X1 (Perceived Ease of Use)	5.475	0.000	Positive and significant effect
X2 (Perceived Usefulness)	5.448	0.000	Positive and significant effect

Source: Primary Data, processed (2026).

The simultaneous F-test, presented in Table 8, produced F = 47.935 with Sig. = 0.000 (< 0.05), so H3 is accepted: perceived ease of use and perceived usefulness jointly have a positive and significant effect on user satisfaction with CEISA 4.0 at KPPBC TMP B Bandar Lampung. This confirms that the improvement of user satisfaction is not driven by a single factor, but by the combined perception of ease of use and the benefits obtained from the system.

Table 8. Simultaneous Test (F-Test) Results

Model	F	Sig.	Conclusion
Regression	47.935	0.000	Significant simultaneous effect

Source: Primary Data, processed (2026)

3.6 User Satisfaction Level Based on the System Usability Scale (SUS)

Processing of the 91 valid responses produced a mean SUS score of 74.45, indicating an overall positive assessment of CEISA 4.0's usability. Interpreted through the Acceptability Range, 46 respondents (50.5%) rated the system as Acceptable and 45 (49.5%) as Marginal, with no respondent rating the system as Not Acceptable. Interpreted through the Grade Scale, the mean score of 74.45 falls into Grade B (Good), although the underlying distribution was uneven: 27.5% of respondents scored the system into Grade A (Excellent), 19.8% into Grade B (Good), 9.9% into Grade C (Fair), and 42.9% into Grade D (Poor). Interpreted through Adjective Ratings, 52.7% of respondents rated the system as Good, 24.2% as Excellent, and 23.1% as Best Imaginable, with none rating it below Good. Taken together, these results show that CEISA 4.0 has achieved an Acceptable, Grade B, "Good" level of usability overall, while the substantial share of Marginal/Grade-D responses indicates that a meaningful segment of users-particularly those still adapting to modules undergoing phased or mandatory rollout-has not yet experienced the system as consistently positively as the majority.

Table 9. SUS Score Distribution by Interpretation Method

Interpretation	Category	Frequency	Percentage (%)
Acceptability Range	Acceptable (71-100)	46	50.5
	Marginal (51-70)	45	49.5
Grade Scale	A - Excellent (80.3-100)	25	27.5

Interpretation	Category	Frequency	Percentage (%)
	B - Good (74-80.3)	18	19.8
	C - Fair (68-74)	9	9.9
	D - Poor (51-68)	39	42.9
Adjective Ratings	Best Imaginable (85-100)	21	23.1
	Excellent (74-85)	22	24.2
	Good (53-74)	48	52.7

Source: Primary Data, processed (2026). Mean SUS score = 74.45 (N = 91).

3.7 Discussion

3.7.1 Effect of Perceived Ease of Use on User Satisfaction

The finding that perceived ease of use has a positive and significant effect on user satisfaction confirms H1 and indicates that the easier CEISA 4.0 is to learn, understand, and operate, the higher the satisfaction users report. Among the four indicators of perceived ease of use, three-ease of learning, clarity of interaction, and overall ease of use-received high average ratings, while the indicator "interaction with CEISA 4.0 requires much effort" received a comparatively lower rating (mean 2.84, moderate category), the lowest among the four.

This pattern is plausibly linked to specific operational features of CEISA 4.0 at KPPBC TMP B Bandar Lampung: users must complete Multi-Factor Authentication (MFA) via a One-Time Password before accessing the system, and excise-service users must additionally enter their Excisable Goods Entrepreneur Registration Number (NPPBKC), which at times requires manual adjustment if not yet recognized by the system. These extra steps, together with the phased transition of the excise module toward mandatory implementation under PER-20/BC/2025 and KEP-147/BC/2026, likely explain the relatively lower rating on this single indicator without indicating that the system is difficult to use overall, since the other three indicators remained in the high category.

These results are consistent with the Technology Acceptance Model (Davis 1989; Kim 2024), under which perceived ease of use shapes not only technology acceptance but also users' post-use evaluation, and with the Information System Success Model (DeLone and McLean 2003), in which system quality is a key determinant of user

satisfaction; they are further corroborated by the Acceptable/Grade-B SUS result, which similarly reflects a generally positive but not uniformly experienced usability. The finding is consistent with (Rahman and Harianto 2023), who found that ease of use shapes perceived usefulness and, in turn, user acceptance of CEISA, but differs from (Kala et al. 2024) and (Raihan and Prasetyo 2025), who found no significant effect of perceived ease of use on user satisfaction-a difference plausibly attributable to CEISA 4.0's character as a system used repeatedly in routine operational business processes, in which ease of use plays a more direct role in shaping user experience than in the systems examined in those studies.

3.7.2 Effect of Perceived Usefulness on User Satisfaction

The finding that perceived usefulness has a positive and significant effect on user satisfaction confirms H2: the greater the benefit users perceive from CEISA 4.0, the higher their satisfaction with the system. All five indicators of perceived usefulness received high average ratings, indicating that respondents generally view CEISA 4.0 as improving the effectiveness and efficiency of customs and excise business processes rather than merely digitizing them. Even so, the indicators "CEISA 4.0 provides benefits in my work" and "my work becomes more difficult without CEISA 4.0" received a disproportionate share of disagreement, concentrated among excise-sector respondents (47.62% of such responses), plausibly reflecting the fact that the excise module was still in a piloting/transitional stage at the time of the survey, with some services still relying on the previous CEISA version.

This finding is consistent with the Technology Acceptance Model (Davis 1989; Kim 2024) and with the Information System Success Model (DeLone and McLean 2003), in which net benefits contribute to user satisfaction, and is corroborated by the Acceptable/Grade-B SUS result. It aligns with (Kala et al. 2024) and (Raihan and Prasetyo 2025), who likewise found perceived usefulness to be a significant, consistent determinant of user satisfaction across different information-system contexts, and is consistent with (Rahman and Harianto 2023), who found that

perceived usefulness shapes attitude and acceptance toward CEISA, even though that study did not measure satisfaction directly.

3.7.3 Simultaneous Effect of Perceived Ease of Use and Perceived Usefulness, and Overall User Satisfaction

The simultaneous test confirms H3: perceived ease of use and perceived usefulness jointly, and significantly, affect user satisfaction, together explaining 51.1% of its variance. This indicates that user satisfaction with CEISA 4.0 is not shaped by a single factor but emerges from the combined, complementary effect of how easily the system can be operated and how much benefit it delivers-consistent with the SUS finding that CEISA 4.0 sits at an Acceptable, Grade-B level of usability rather than at either extreme, and with prior studies such as (Kala et al. 2024) and (Raihan and Prasetyo 2025) that identify user perception of a system as a key determinant of satisfaction.

The remaining 48.9% of variance unexplained by the model, together with the sizeable share of Marginal/Grade-D SUS responses, is consistent with the discussion above: users still adapting to the MFA/NPPBKC authentication steps and to modules undergoing phased or mandatory rollout-particularly in the excise category-report a less uniformly positive experience than other user groups, even though the overall pattern of results remains positive. Based on these findings, DJBC is encouraged to continue simplifying the CEISA 4.0 authentication and validation flow without weakening security, accelerate the refinement of modules still under development (especially the excise module), strengthen system stability and interface consistency, and conduct periodic usability evaluation using SUS alongside ongoing socialization and technical assistance for all user groups, so that ease of use and perceived usefulness continue to improve together and user satisfaction can be sustained and enhanced over time.

3.7.4 User Satisfaction Level Based on the System Usability Scale (SUS)

The SUS measurement shows that CEISA 4.0 obtained a mean score of 74.45, placing it in the Acceptable category with Grade B, indicating a generally good level of usability. Most SUS indicators-particularly those relating to ease of use, confidence in operating the system, functional integration, and willingness to continue using CEISA 4.0-were rated positively by the majority of respondents. Even so, a number of respondents still gave Strongly Disagree or Disagree responses on several indicators (Y2, Y4, Y6, and Y10), indicating that some users have not yet obtained a fully optimal experience and that certain usability aspects still require refinement.

This condition is consistent with the earlier discussion of perceived ease of use and perceived usefulness, in which the effort required to interact with the system and the benefits felt by some users-particularly in the excise category, whose modules were still transitioning toward mandatory implementation-were rated comparatively lower. This suggests that the user experience measured through SUS is shaped by the totality of user characteristics, service variation, and module maturity, rather than by ease of use or usefulness in isolation.

These results reinforce the Information System Success Model (DeLone and McLean 2003), in which user satisfaction is a key indicator of information-system success, and confirm that TAM and ISSM are complementary: TAM explains the perceptions that shape satisfaction, while ISSM situates that satisfaction within a broader success framework. The finding is also consistent with (Zahratul et al. 2023), who likewise found CEISA 4.0's usability to be good but in need of further refinement. Overall, the results indicate that CEISA 4.0 provides a good user experience, and that continued attention to interface consistency, system stability, and ongoing user assistance-guided by periodic SUS evaluation-would help extend this experience more evenly across all user groups.

4. Conclusion

Based on the analysis of the effect of perceived ease of use and perceived usefulness on user satisfaction with the CEISA 4.0 system at KPPBC TMP B Bandar Lampung, the

following conclusions are drawn. First, perceived ease of use has a positive and significant effect on user satisfaction: the more easily CEISA 4.0 can be learned, understood, and operated, the higher the satisfaction reported by users. Second, perceived usefulness has a positive and significant effect on user satisfaction: the greater the perceived benefit for work effectiveness and efficiency, the higher user satisfaction with the system.

Third, perceived ease of use and perceived usefulness jointly have a positive and significant effect on user satisfaction, together explaining 51.1% of its variance, while the remaining 48.9% is explained by factors outside the model; this confirms that ease of use and perceived benefit are complementary rather than independent determinants of satisfaction with CEISA 4.0. Fourth, the System Usability Scale measurement produced a mean score of 74.45, placing CEISA 4.0 in the Acceptable category with Grade B, indicating that the system has generally provided a good and acceptable user experience-consistent with the user-satisfaction dimension of the Information System Success Model-although room for improvement remains.

5. Implication, Limitations, And Suggestions

5.1 Implications

This study reinforces the relevance of the Technology Acceptance Model in a digital public-service context by confirming that perceived ease of use and perceived usefulness shape user satisfaction with CEISA 4.0, and shows that combining TAM-based relational analysis with SUS-based usability evaluation gives a more comprehensive picture of satisfaction. It further supports the Information System Success Model's view of user satisfaction as a key success indicator, so that TAM, ISSM, and SUS can be regarded as complementary lenses for evaluating public information-system implementation.

For DJBC, sustaining and improving CEISA 4.0 requires balanced attention to ease of use-through a simpler authentication mechanism, streamlined user-data validation, and a more consistent, better-guided interface-and to perceived usefulness-through faster service processing, need-based feature refinement, and continued stabilization

of modules still under development, particularly the excise module. Periodic usability evaluation using SUS is recommended as a standing input into CEISA 4.0's development roadmap.

5.2 Limitations

This study is limited to CEISA 4.0 users at KPPBC TMP B Bandar Lampung and to two TAM constructs (perceived ease of use and perceived usefulness), so it does not capture other potential determinants of satisfaction such as system, information, or service quality. User satisfaction was measured only through SUS at a single point in time using a quantitative questionnaire, so the results reflect one snapshot of usability experience and do not explore the underlying reasons behind respondents' perceptions through qualitative methods.

5.3 Suggestions

For DJBC, it is suggested to continue simplifying CEISA 4.0's authentication and validation flow, direct feature development toward users' real needs, and conduct periodic satisfaction evaluation using SUS alongside ongoing user socialization and technical assistance. For future academic research, it is suggested to broaden the scope to other customs and excise offices, add other potential determinants of satisfaction (e.g., system, information, and service quality, or user trust), adopt a longitudinal or mixed-methods design, and develop a more integrated TAM-ISSM model to more thoroughly explain the relationships among technology acceptance, user satisfaction, and net benefits.

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