

Research Article

Acceptance and Use of the Integrated Service Information System (Silangit) at the Tegal Fisheries Training and Extension Center: The Utaut and Delone-McClean Approaches

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Abstract. The implementation of the Integrated Fisheries Services Information System (SILANGIT) at the Tegal Fisheries Training and Extension Center (BPPP) aims to promote the digitization of fisheries training and certification registration. However, users' utilization of the system has not yet been optimal and continues to face technical and operational challenges. This study aims to analyze the factors influencing *Behavioral Intention* and *Actual Use Behavior* of the SILANGIT application by integrating the *Unified Theory of Acceptance and Use of Technology* (UTAUT) framework and the *DeLone & McLean Information Systems Success Model*. This quantitative study employed *Partial Least Squares-based Structural Equation Modeling* (PLS-SEM) using SmartPLS. The sample comprised 386 respondents selected via *Proportional Stratified Random Sampling* based on the Slovin formula and statistical power thresholds. The results of the hypothesis testing indicate that all direct hypotheses have a positive and significant effect ($p < 0,05$). *Social Influence* is the most dominant predictor of *Behavioral Intention*, followed by *Effort Expectancy*, *Information Quality*, *System Quality*, and *Performance Expectancy*. These five variables collectively explain the variance in *Behavioral Intention*. Furthermore, *Behavioral Intention* and *Facilitating Conditions* were found to have a strong direct effect on *Use Behavior*. Through Priority Index analysis, active feature exploration was identified as the primary operational gap. The practical implications of this study recommend improving the PTSP *Helpdesk* services, optimizing the application to make it lighter and more data-efficient, and *conducting edutainment-based* outreach to encourage optimal and sustainable system usage.

Keywords: Behavioral Intention; DeLone & McLean; PLS-SEM; SILANGIT; UTAUT.

1. Introduction

Digital transformation has now become a crucial agenda across various sectors, including the public sector, to improve efficiency and service quality. The public sector is encouraged to adopt information technology to optimize business processes and provide added value to the community (Mardiana et al., 2015a). In Indonesia, government agencies are striving to improve public services, and these initiatives are often realized through the development of information systems.

In the era of the Fourth Industrial Revolution, the demand for fast, transparent, and efficient public services is increasing. Government agencies, as the frontline of service delivery, are required to innovate. One crucial area in need of modernization is service administration, which directly impacts interactions with the public. BPPP Tegal, as part of the KKP, is no exception to this challenge. The certification services it provides are vital

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services that contribute to non-tax state revenue (PNBP) and influence the agency's reputation.

As of mid-2024, all administrative processes for certification services at BPPP Tegal were still manual and conventional. This approach was not only time-consuming but also prone to errors, which could lead to lengthy bureaucratic processes and lower trainee satisfaction levels. This gap created an urgent need for a digital solution. In response, in 2024, BPPP Tegal took a strategic step by implementing the Tegal Service Information System (SILANGIT). This system was designed to automate the entire administrative process for certification services, from registration to certificate issuance.

The success of an information system's implementation depends not only on its existence but also on the quality of the system itself. A high-quality system—characterized by ease of use, reliability, and accurate information is a key driver for users to adopt the system (Buzin et al., 1978).

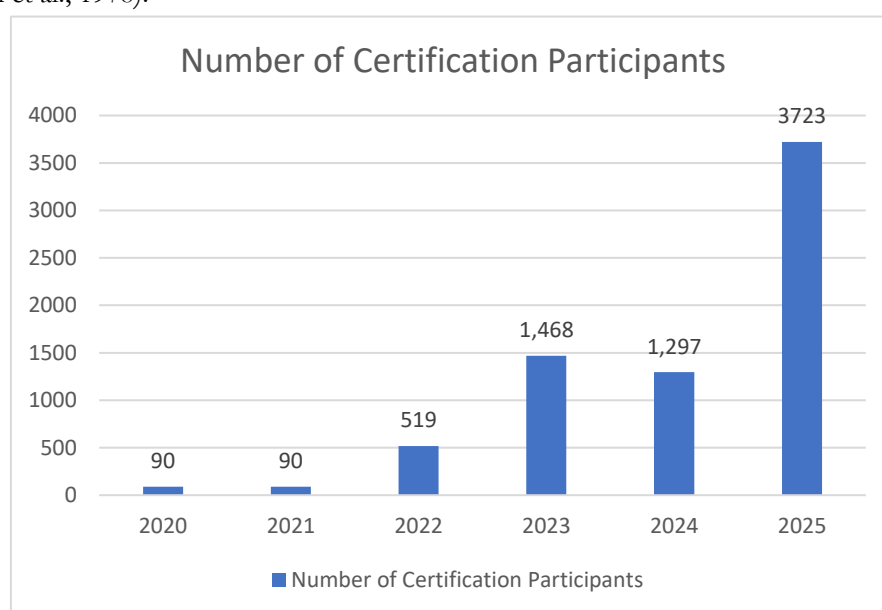


Figure 1. Number of Certification Participants.

Source: BPPP Tegal Annual Performance Reports for 2023 and 2024

Based on the “Number of Certification Participants” graph shown, the trend in the number of certification participants from 2020 to 2024 can be analyzed: the number of participants tended to remain stagnant at a very low level from 2020 to 2021, at 90. However, there was a very significant surge in participants from 2021 to 2022, rising from approximately 90 to 519. This trend of drastic increase continued from 2022 to 2023, with the number of participants jumping from 519 to 1,468—the peak for this period. Subsequently, the number of participants experienced a slight decline from 2023 to 2024, from 1,470 to 1,297, and then rose to 3,723. Based on this trend, it can be seen that the number of certification participants experienced explosive growth between 2021 and 2023, followed by a slight decline in 2024 and an increase in 2025. From this data, the research can focus on examining the Integrated Service Information System (Silangit) in driving the increase in the number of certification participants.

This study aims to identify the factors that influence users of the Integrated Service Information System (Silangit) at the Tegal Fisheries Training and Extension Center, based on the UTAUT theory and the Delone and McLean model. According to Venkatesh et al. (2016),

the use of technology can produce cumulative effects that improve work systems. This means that the intensity of system usage will increase as users utilize more features, integrate them into their workflows, and discover new or innovative ways to use them. This research model is further enriched by the constructs of “habit” and “price value” in technology usage, as both are considered to have a significant influence while entailing relatively affordable implementation costs.

Rapid technological advancements, including the expansion of the internet and the adoption of digitalization, have significantly transformed various sectors, including training management. It is within this context that the Integrated Service Information System (Silangit) from BPPP Tegal serves as a digital solution designed to support online training registration and administration.

Based on initial interviews with the head of the Silangit division and a survey of 20 Silangit system users, it was found that the utilization of Silangit as a system for participant registration and data collection has not yet been optimal.

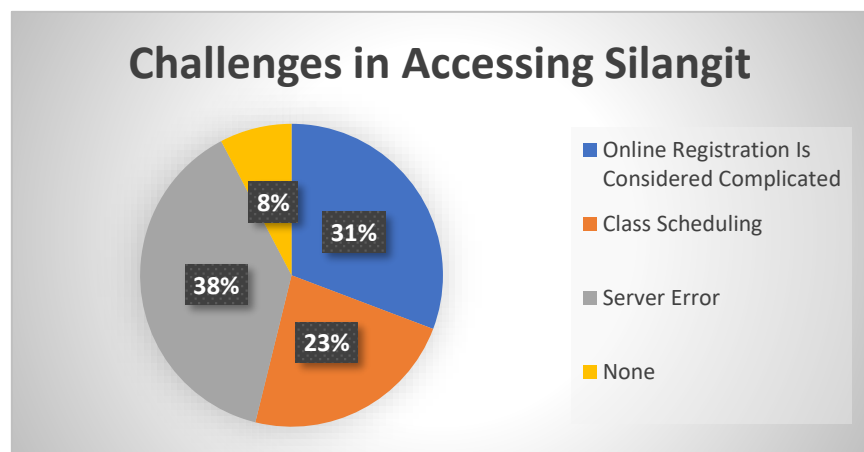


Figure 2. Challenges in Accessing Silangit.

Source: BPPP Tegal Annual Performance Reports for 2023 and 2024

Based on the results of a survey of the SILANGIT system among participants and employees of BPPP Tegal, the main challenges in accessing SILANGIT were dominated by technical infrastructure issues (server errors), where SILANGIT was sometimes inaccessible and required coordination with the server administrator for repairs. Additionally, participants or partners who are reluctant to register their participants in the system—perceiving it as cumbersome must *enter data manually*, one by one. These two challenges account for 69% of all reported issues. The issue regarding class scheduling arises during training sessions: the administrative staff at must schedule participants attending that day's training into classes according to the selected training program to facilitate data compilation by the secretary. However, this class assignment process sometimes encounters difficulties because the system cannot automatically assign participants to classes based on their names, requiring the names to *be re-entered manually*. Only 8% of users reported no difficulties accessing SILANGIT.

Although SILANGIT has successfully boosted the efficiency and operational reach of BPPP Tegal, its effective utilization still faces a number of obstacles. These include server errors, server errors when downloading trainee data, and the inability to assign trainees to classes. Furthermore, there is an urgent need to develop features based on user feedback—such as facial recognition for participant attendance tracking, a help desk service, and

notifications for new registrants—to enhance the system’s functionality. Given the fluctuations in the number of certification exam participants, this study focuses on analyzing the extent to which Silangit supports an increase in the number of training and certification participants. Additionally, this study aims to formulate development strategies that can strengthen Silangit’s contribution to the institution’s future revenue.

The UTAUT theory in this study is utilized to analyze the process of technology system adoption within an organization. On the other hand, the Delone and McLean Model is used to analyze the system itself. UTAUT has three constructs or independent variables that are tested: Performance Expectancy, Effort Expectancy, and Social Influence. Meanwhile, the Delone and McLean Model also has three constructs or independent variables that are analyzed: Information Quality, System Quality, and Facilitating Conditions.

The study by Thabet et al. (2024) on the adoption of telemedicine technology has high methodological relevance to the SILANGIT system study because both integrate behavioral factors from the UTAUT model and quality factors from the DeLone & McLean model. In that study, the *Performance Expectancy* variable proved to be the primary driver of technology adoption, which directly supports Hypothesis H1 in the SILANGIT study—that the perceived usefulness of the system will increase users’ *Behavioral Intention*.

From the perspective of information system quality, the variables *Information Quality* (IQ) and *System Quality* (SQ) in the journal were found to substantially influence satisfaction, which ultimately leads to service adoption. This provides a strong empirical foundation for the SILANGIT framework, which posits that the accuracy of certification data and the technical reliability of the system are the primary foundations for building *Behavioral Intention*. Overall, these correlations indicate that to achieve the *Use Behavior* target in SILANGIT, the management of BPPP Tegal must not only focus on user performance expectations but also ensure that system and information quality are at the “Very Good” level in accordance with the efficiency standards of the Public Service Agency (BLU).

2. Literature Review

Strategic Management

Strategic management is a systematic process for formulating, implementing, and evaluating strategies that enable an organization to achieve its long-term goals. In the book *Strategic Management and Competitive Advantage: Concepts* by **Barney & Hesterly (2020)**, strategic management is defined as a series of analyses and choices carried out sequentially to increase the likelihood that a company will choose a good strategy—that is, a strategy that generates a competitive advantage (**Barney & Hesterly, 2020**).

Silangit

Silangit is a system designed to optimize the management of corporate training programs, with a primary focus on integrating various essential administrative functions—ranging from training registration and the certification process to comprehensive participant data management. Additionally, the system includes vital features for daily operations, such as managing participant and trainer attendance records, and provides an integrated helpdesk service. To support oversight functions, Silangit is also equipped with a dashboard for monitoring non-tax state revenue (PNBP), with data updated daily.

UTAUT

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh, Morris, and Davis in 2003 as a synthesis of eight previous theories and models explaining the acceptance and use of technology (Mardiana et al., 2015b). The primary objective of UTAUT is to identify the critical factors and contingencies associated with predicting behavioral intention to use technology and actual technology use, particularly within an organizational context (Venkatesh et al., 2003). In the study by Susantyo et al. (2026), the UTAUT model was used to analyze the adoption of digital utility applications, with technology literacy added as a moderator variable that strengthens the relationship between usage intention and actual usage.

DeLone and McLean

One of the most well-established and widely recognized models for assessing information system (IS) success is the model developed by DeLone and McLean (Mardiana et al., 2015b). This model was first introduced in 1992 as an effort to synthesize previous research on IS success and provide a coherent framework for future research (DeLone & McLean, 1992).

The original D&M model was built on communication theory (Shannon & Weaver, 1949) and its extensions (Mason, 1978). (Shannon & Weaver, 1949) identified three levels of communication: the technical level (system accuracy and efficiency), the semantic level (the success of information in conveying the intended meaning), and the effectiveness level (the impact of information on the recipient) (DeLone & McLean, 1992). Mason (1978) subsequently developed this effectiveness level into a hierarchy of events influencing the recipient (DeLone & McLean, 1992).

3. Materials and Methods

This study employs a quantitative approach with a cross-sectional design using a positivist paradigm. The population of this study consists of training participants using Silangit at BPPP Tegal, totaling 11,000 users. The sampling technique used was *stratified random sampling*, resulting in a sample size of 386 participants representative of the population for analysis in this study. Data were collected through questionnaires and a literature review. Data analysis techniques included instrument validation, descriptive statistical analysis, Structural Equation Modeling (SEM), the Successive Interval Method, Measurement Model Evaluation (Outer Model), Structural Model Evaluation (Inner Model), and hypothesis testing.

4. Results and Discussion

Based on the results of *the outer loading* analysis, the SI1 indicator of the *Social Influence* variable was recorded as the indicator with the highest overall correlation value, at 0.902. This was followed by the BI1 indicator from the *Behavioral Intention* variable with a value of 0.886, and the EE1 indicator from the *Effort Expectancy* variable with a value of 0.873. These high *outer loading* values indicate that these indicators are the most valid, reliable, and representative measures for users in evaluating the implementation of the SILANGIT application.

Discriminant validity testing was conducted to ensure that each latent variable is empirically unique and capable of capturing phenomena distinct from those of other constructs. This study applied the *Heterotrait-Monotrait Ratio of Correlations* (HTMT) criterion, which has a higher level of accuracy compared to conventional approaches. The test results showed that all HTMT ratio values between pairs of latent variables were well below the required strict threshold of 0.85. The highest correlation was recorded between “*Use Behavior*” and “*Behavioral Intention*,” at 0.750. These results empirically confirm that all latent constructs are free from multicollinearity and possess excellent discriminant validity.

To test the model’s *goodness of fit*, the *Standardized Root Mean Square Residual* (SRMR) indicator was used to measure how well the conceptual model describes the empirical data. Based on the criteria established by Hu & Bentler (1999), a model is considered acceptable if the SRMR value is below 0.08. Testing of the SILANGIT structural model yielded an SRMR value of 0.048 for *the saturated model* and 0.052 for *the estimated model*. Since these figures are below the 0.08 threshold, it can be concluded that the residual error between the structural model theory and the empirical data correlations is very small; thus, this research model is considered to fit very well and is suitable for hypothesis testing.

In the structural model (*inner model*) analysis, the evaluation began by examining the Coefficient of Determination (R^2) to measure the proportion of variance in the endogenous variables that can be explained by the exogenous variables. The *Behavioral Intention* (BI) variable yielded a R^2 of 0.564 (56.4%), which falls into the moderate category. This indicates that the combination of the five independent variables—*Effort Expectancy* (EE), *Information Quality* (IQ), *Performance Expectancy* (PE), *Social Influence* (SI), and *System Quality* (SQ)—can explain 56.4% of the variance in users’ behavioral intention to adopt SILANGIT, while the remaining 43.6% is influenced by other variables outside the model. Meanwhile, the *Use Behavior* (UB) variable—yielded a value of 0.462 (46.2%) for the “ R^2 ,” indicating that *Behavioral Intention* (BI) and *Facilitating Conditions* (FC) collectively contribute 46.2% to determining actual usage behavior in the field.

Effect size testing (f^2) was then conducted to assess the practical magnitude of each independent variable’s contribution to its dependent variable. The variables PE ($f^2 = 0,153$), EE ($f^2 = 0,191$), SI ($f^2 = 0,170$), IQ ($f^2 = 0,150$), and SQ ($f^2 = 0,141$) all fall within the range of moderate ($f^2 > 0,15$) to near-moderate effects, confirming that all of these independent variables make substantial and ideal contributions to shaping *Behavioral Intention*. On the other hand, the path relationships from *Behavioral Intention* to *Use Behavior* ($f^2 = 0,279$) and from *Facilitating Conditions* to *Use Behavior* ($f^2 = 0,267$) fall into the moderate-to-strong effect category, meaning that both variables play a very important role in driving actual usage levels.

Hypothesis testing confirmed that all determining factors—*Social Influence*, *Effort Expectancy*, *Information Quality*, *System Quality*, and *Performance Expectancy*—have a positive and significant effect on users’ intention to adopt the SILANGIT app. *Social Influence* emerged as the most dominant predictor in shaping *Behavioral Intention* ($\beta = 0,294$; $T = 8,760$; $p = 0,000$), indicating that encouragement from the environment, leaders, and peers exerts the primary positive pressure on users to adopt this system. These findings align with research (Mansour et al., 2020) that emphasizes the crucial role of social influence in information system adoption. Ranking second, *Effort Expectancy* ($\beta = 0,284$; $T = 7,892$; $p = 0,000$)

demonstrates that ease of navigation and system operation increases user commitment, which supports the findings of Wu et al. (2021) and Mansour et al. (2020) regarding the direct relationship between effort expectancy and intention to adopt technology. Furthermore, *Information Quality* ($\beta = 0,283 ; T = 8,390 ; p = 0,000$) contributes significantly because the accuracy, completeness, and timeliness of the information presented by SILANGIT have proven capable of building user trust, in line with the study by Ningsih et al. (2022). *System Quality* ($\beta = 0,270 ; T = 8,164 ; p = 0,000$) also demonstrated a significant influence, as the application's technical reliability and response speed enhance user convenience, as confirmed by the study by Puspitasari et al. (2020). Finally, *Performance Expectancy* ($\beta = 0,256 ; T = 7,378 ; p = 0,000$) further confirms that perceived operational benefits and administrative efficiency can positively drive usage intention, in line with the findings of (Wu et al., 2021)

Meanwhile, actual usage behavior of the SILANGIT app in the field is directly and significantly determined by *behavioral intention* and the availability of infrastructure (*facilitating conditions*). *Behavioral Intention* acts as the most dominant predictor in driving the actual use of the SILANGIT system ($\beta = 0,416 ; T = 10,486 ; p = 0,000$), proving that users' intentions and commitment concretely translate into actions in utilizing the app's features, which supports the empirical findings of Wu et al. (2021) and Ningsih et al. (2022). In addition to intention, *Facilitating Conditions* ($\beta = 0,408 ; T = 9,969 ; p = 0,000$)—such as the availability of supporting infrastructure including devices, internet connections, and technical support—also exert a very strong and direct influence on *Use Behavior*. The availability of these facilitating resources is a key determinant of whether the system can be accessed and utilized sustainably, as further confirmed in the study by (Wu et al., 2021)

Facilitating Conditions: The availability of supporting infrastructure—such as devices, internet connections, and technical support—also has a very strong and direct influence on *use behavior* ($\beta = 0,408 ; T = 9,969 ; p = 0,000$). The availability of these resources is a key determinant of whether the system can be accessed on an ongoing basis, as confirmed by research (Wu et al., 2021).

This study identifies several strategic managerial implications for the Tegal Fisheries Training and Extension Center (BPPP). First, given that *social influence* is a key driver of intention, management is advised to strengthen operational regulations by issuing a circular or official directive regarding the mandatory use of SILANGIT throughout the entire training administration process. Second, since *facilitating conditions* directly influence actual usage, the Tegal BPPP needs to provide a responsive and on-call *Helpdesk/Live Chat* technical support service through the PTSP, as well as perform technical optimizations to make the application run more smoothly and conserve internet data usage for users in coastal areas.

Third, regarding the role of *Effort Expectancy*, redesigning the user interface (UI/UX) to be more intuitive and user-friendly should be prioritized to facilitate accessibility for the general public. Fourth, an analysis of indicator priorities shows that user engagement in exploring the app's features remains the largest gap. Therefore, management is recommended to conduct regular outreach activities and develop interactive *edutainment-based* guidance modules. This step is expected to shift usage behavior from what was originally passive and transactional to optimal, active, and sustainable use of the system.

5. Comparison

When compared to the study by Thabet et al. (2024), which integrated the UTAUT2 model and the IS Success Model into the context of *telemedicine* adoption, their research strongly emphasized the roles of *performance expectancy* and *user satisfaction* as the primary drivers of adoption. In contrast, the findings regarding the SILANGIT system indicate that in the context of public administration, which tends to be mandatory-oriented, *Social Influence* ($\beta = 0,294$; $p = 0,000$) emerges as the most dominant predictor of *Behavioral Intention*, followed by *Effort Expectancy* ($\beta = 0,284$) and *Information Quality* ($\beta = 0,283$). The integrated framework in this study proved effective, explaining 56,4% % of the variance in *Behavioral Intention* ($R^2 = 0,564$) and 46,2% % of the variance in *Use Behavior* ($R^2 = 0,462$).

Furthermore, this study contributes to the translation of general knowledge into concrete action regarding infrastructure provision. Unlike the study by Susantyo et al. (2026), which identified technology literacy as a moderating variable in the adoption of a public utility app (PLN Mobile), this study directly addresses operational barriers in the field by demonstrating that *Facilitating Conditions* ($\beta = 0,408$; $p = 0,000$) have a strong and direct influence on *Use Behavior*. This clarifies the bridge between usage intention and actual utilization among users of fisheries training services. Furthermore, the methodological and practical novelty of this study is demonstrated through the expansion of the analysis using the Priority Index. This analysis successfully identified operational gaps at the level of user feature exploration, which subsequently led to tactical recommendations tailored to the needs of coastal regions—such as optimizing the application to conserve internet data, providing a responsive PTSP *helpdesk*, and *implementing* interactive *edutainment-based* outreach programs.

6. Conclusion

The conclusion must briefly and concisely summarize the contents of the document or essay. This section may include: (1) A summary of the main results, findings, and evidence from your research or analysis; (2) A synthesis of the findings—specifically, the relationship between the findings and the research objectives—and an explanation of how these findings support the arguments or hypotheses; (3) The author may also discuss the implications of the research findings for the benefits of the research. What is the contribution or impact on the knowledge or topic discussed? (4) Limitations and suggestions for further research.

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