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# Evaluating Application Integration Success Using DeLone McLean and CSF Model

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***Abstract*** **-** Digital transformation in the financial industry encourages organizations to adopt application integration systems to enhance operational efficiency and effectiveness. However, many information system implementation projects fail to meet expectations, particularly in guarantee institutions characterized by complex business processes. This study evaluates the success of an application integration system project in a guarantee company by applying an integrated framework that combines the DeLone and McLean (D&M) (2003) Information System Success Model with Critical Success Factors (CSF). By explicitly positioning CSF variables as antecedents of system quality, information quality, and service quality, this study extends the conventional use of the D&M model by incorporating managerial and organizational perspectives into the assessment of integration success. A quantitative approach is employed using survey data collected from 120 users of the Penjaminan Application Integration (PAI) system at PT XYZ, which are analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that CSF variables—namely top management support, internal communication, user training, and project risk management—significantly influence system quality, information quality, and service quality. Furthermore, these three quality dimensions have a significant effect on intention to use and user satisfaction, which in turn impact perceived net benefits for the organization. In conclusion, integrating managerial and system quality perspectives provides a more comprehensive understanding of application integration project success. These findings offer practical insights for improving IT project implementation strategies in the guarantee sector and in other industries with similar organizational and operational characteristics.

***Keywords*****:** information systems, application integration, DeLone & McLean, Critical Success Factors, SEM-PLS

## I. INTRODUCTION

The digital transformation within the financial sector drives organizations to embed information technology into their business processes to enhance efficiency, effectiveness, and competitiveness (Yudiawan et al., 2022; Fahmi, 2024). One widely adopted strategy is application integration, which combines multiple systems and modules into a single architecture that is functionally and data-connected. Such systems enable faster, more accurate, and well-documented flows of information and coordination across organizational units (Panjaitan & Nasution, 2024). In practice, application integration is often implemented through web applications and Application Programming Interfaces (APIs) that link cross-process services in real time (Azzahra et al., 2023).

Despite its potential, failures in implementing integration systems remain frequent. Long-term assessments of information systems implementation similarly show that recurring challenges in alignment, coordination, and system integration continue to impede successful outcomes across organizations (Loureiro et al., 2024). The CHAOS 2020 report by the Standish Group (Portman, 2021) reveals that only about 31 percent of information technology projects are deemed successful, while the remainder suffer from partial failure or are not completed at all. The causes of these failures are not purely technical; they also involve managerial and organizational aspects such as limited top-management support, poor project

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communication, inadequate training, and weak risk management (Hadi et al., 2023). Similar issues are observed in a case study at PT XYZ. In this guarantee company, the application integration platform is intended to accelerate underwriting administration, simplify cross-division verification, and improve transaction data traceability. Although the system is designed to enhance business-process efficiency, many integration projects fail to deliver optimal outcomes. Internal records at PT XYZ show that among six integration projects developed in recent years, roughly half encounter significant system-integration failures. Problems such as low user adoption, data synchronization disruptions, confusing user interfaces, and delayed system notifications indicate that the integration initiatives do not fully meet their objectives.

The shortcomings arising from challenges during the implementation phase highlight the inadequacies of the many frameworks used to assess information-system project success. Fully formulated concepts are built based on the DeLone and McLean (D&M) model, and many specialists are familiar with the D&M model. Some available parameter sets cover system quality, information quality, service quality, user satisfaction, and the overall benefits of the system (Bashiri et al., 2023). Recent scholarly evaluations also point out that several dimensions of the D&M framework require reinterpretation to remain applicable to contemporary implementation environments, particularly as digital processes become more deeply integrated into organizational operations (Jeyaraj, 2020). Additionally, the model pays little attention to key managerial factors relevant to integrating numerous operational applications. These gaps are best addressed using criteria that reflect not only technical parameters but also underlying management complexity. The Critical Success Factors (CSF) approach, with its emphasis on project determinants, is often used to identify critical success factors, including executive sponsorship, internal communications, user training, and risk management (Anaam et al., 2023; Pereira et al., 2022). This view is supported by recent studies in ICT project environments, which show that managerial and organizational elements such as coordination mechanisms, stakeholder involvement, and structured governance play a pivotal role in ensuring project success and sustaining system performance (Adywiratama et al., 2022).

This study aims to synthesize the D&M model and the CSF framework to comprehensively evaluate the success of application-integration projects at PT XYZ. It examines the correlation between technical factors—namely system quality, information quality, and service quality—and managerial factors such as management support, communication, training, and risk management, with respect to the mediating variables of intention to use and user satisfaction, as well as the perceived net benefits for the organization. A quantitative survey is conducted with 120 active users of the Penjaminan Application Integration (PAI) system at PT XYZ, and the data are analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) (Hair et al., 2021).

The primary contribution of this research lies not only in offering practical insights into the success or failure of application-integration projects, but also in refining the framework for evaluating information-technology project outcomes through a combined model. Theoretically, the study extends the traditional scope of information-system evaluation by incorporating managerial dimensions that are often overlooked. The findings are expected to guide improvements in information-technology implementation policies within the guarantee sector and other industries facing similar organizational and operational complexities.

Previous studies extensively employ the D&M model and the CSF framework to assess information systems success. However, empirical studies that specifically examine application integration contexts remain relatively limited. Unlike systems that are primarily evaluated through intensive user interaction, application integration mainly supports internal operational processes and cross-system coordination. In such settings, system stability, process continuity, and data consistency are more critical than aspects related to direct user interaction. This study contributes to the literature by extending the integrated D&M–CSF framework to the context of application integration in the financial guarantee sector, which is characterized by mandatory system use, strict regulatory requirements, and complex interdepartmental dependencies. By examining managerial factors as direct determinants of information quality, system quality, and service quality in this context, the study provides contextual insights that complement and extend prior D&M–CSF research conducted in more user-oriented system environments.

## II. METHODS

This study employs a quantitative research design to test a success model for implementing an integrated information system, the PAI, within a guarantee company. The model combines the D&M Information System Success Model with the CSF framework, enabling statistical examination of the relationships among multiple latent constructs and indicators. As illustrated in Figure 1, the research model integrates both technical and managerial dimensions to evaluate the success of the integrated system implementation. This approach is selected because it is well suited for analyzing complex variable interactions in contexts with numerous measurement items. This methodological orientation aligns with broader findings suggesting that the interplay between technological readiness and organizational capability is a key determinant of successful system implementation, particularly in environments undergoing digital integration (Vrchota et al., 2020).

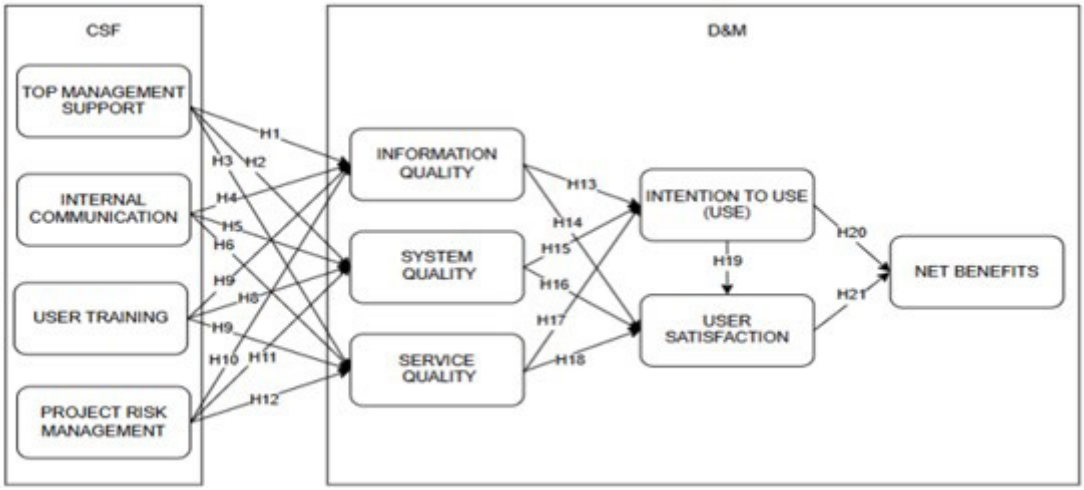


Figure 1 Research Model and Hypotheses

The analysis relies on primary data collected directly from respondents through a structured questionnaire. Respondents are active users of the PAI system at PT XYZ and are drawn from various divisions that use the system in daily operations. A purposive sampling strategy is used to ensure that only employees with direct experience with the integrated system and an understanding of the related workflows participate. This criterion is intended to secure valid assessments of the system's implementation success.

The questionnaire items are adapted from established indicators of the D&M model, which includes key constructs such as system quality, information quality, service quality, system use, user satisfaction, and net benefits. To capture the managerial dimension of project success, four additional variables from the CSF framework are incorporated, namely top-management support, user training, internal communication, and project risk management. Each construct is measured using multiple indicators that are refined to fit the PT XYZ context. All statements use a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to capture respondents' perceptions and levels of agreement.

Data are analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the latest version of the SmartPLS software. PLS-SEM is chosen for its ability to handle models with numerous indicators and relatively small sample sizes. The analysis comprises two main stages: outer-model assessment and inner-model evaluation.

In this study, the outer model is employed to assess the reliability and validity of the measurement indicators. Construct reliability is examined using loading factors, Average Variance Extracted (AVE), and Composite Reliability (CR). At the same time, convergent and discriminant validity are verified to ensure that each variable accurately represents its intended concept. The inner model, in contrast, focuses on evaluating the structural relationships among the latent constructs and testing the significance of each hypothesized path. This stage involves computing t-statistics and p-values through a bootstrapping procedure to assess the robustness of the proposed relationships. Together, these analytical steps strengthen the validity of the research model by combining statistical precision with theoretical coherence.

The integration of information system success dimensions with critical managerial factors enables a more comprehensive assessment of both the technical and organizational aspects of integrated system implementation. By structurally linking managerial antecedents with system, information, and service quality dimensions, the proposed model facilitates a clearer understanding of how organizational readiness and governance practices shape system performance outcomes. This integrated perspective allows the structural model to capture interactions that may not be adequately explained when technical and managerial factors are examined in isolation. Consequently, the methodological design provides empirical insight into the relative contribution of each construct to overall system success. It supports informed decision-making for the continuous improvement of integrated information systems.

## III. RESULTS AND DISCUSSIONS

The survey is administered to 120 employees at PT XYZ who actively use the PAI system as part of their routine professional activities. These respondents are drawn from multiple divisions within the organization, including units responsible for guarantee administration, cross-departmental validation, and management reporting. Each of these functional areas relies heavily on the PAI system for operational coordination and data synchronization, making their insights particularly valuable for assessing the system's effectiveness. By incorporating participants from a variety of work units, the study ensures results that reflect a comprehensive picture of

system utilization across different business processes and managerial levels. This design choice enhances the credibility of the findings by reflecting the actual diversity of PAI usage patterns within the company's ecosystem.

A significant proportion of the surveyed employees have worked at PT XYZ for more than three years, indicating that most respondents possess a deep understanding of the organization's workflows and technology environment. Such tenure implies that they not only witness but also adapt to the company's gradual digital transformation, including the integration of PAI into daily operations. Their accumulated experience enables them to provide nuanced and contextually grounded evaluations of the system's performance, strengths, and shortcomings. Since the PAI platform is used intensively on a day-to-day basis, ranging from document processing to interdepartmental verification, respondents' perceptions accurately reflect the realities of user engagement and system adoption. Consequently, the collected data are considered both authentic and representative, providing a reliable empirical basis for analyzing the factors that influence user satisfaction and the overall success of the integration initiative.

The measurement (outer) model is assessed using PLS-SEM. The adoption of this technique is consistent with recent methodological work demonstrating that PLS-SEM offers strong predictive power for examining information systems success models that include multiple quality dimensions (Riady et al., 2023). The recommended criterion for indicator reliability is met, as all indicator loadings exceed 0.70. The AVE for each construct is above 0.50, demonstrating adequate convergent validity.

Fornell–Larcker's test confirms discriminant validity, as the square root of each construct's AVE is higher than its correlations with other constructs. Internal consistency is also adequate, with all latent variables exhibiting Cronbach's Alpha and CR values above 0.70. These results suggest that the measurement model is robust and suitable for testing the structural relationships among constructs. A summary of the validity and reliability results for each construct is presented in Table 1.

Following the assessment of the measurement model's reliability and validity, the next step is to test the structural model to analyze the hypothesized causal relationships among managerial variables, system quality dimensions, user perceptions, and net benefits. This analytical procedure is consistent with recent evaluations, which emphasize that interpreting structural paths alongside model performance metrics provides a more comprehensive and grounded understanding of the factors that shape system success (Nadella et al., 2024). To calculate path coefficients, t-statistics, and p-values, bootstrapping with 5,000 resamples is used to ensure rigorous two-tailed significance testing. The findings demonstrate a framework with strong interconnectivity and a high degree of integration, in which all four CSFs—Top-Management Support (TMS), Internal Communication (IC), User Training (UT), and Project Risk Management (PRM)—have a significantly positive impact on the three quality dimensions of the D&M model.

Among these managerial factors, Internal Communication emerges as the most influential driver across the quality constructs, with a path coefficient of 0.517 (IC → Information Quality, $p < 0.001$). This finding underscores the importance of transparent and timely communication channels for achieving accurate and complete information, stable system performance, and responsive service delivery. Top-Management Support also demonstrates strong and significant effects on System Quality ($\beta = 0.448$, $p < 0.001$) and Service Quality ($\beta = 0.338$, $p < 0.001$), highlighting the critical role of executive leadership in providing strategic direction, allocating resources, and legitimizing project priorities. The significance of Project Risk Management across all quality dimensions ($\beta$ ranging from 0.263 to 0.438, all $p < 0.001$) indicates that proactive risk identification, mitigation planning, and monitoring are not merely administrative tasks but key determinants of system reliability and service stability. User Training also significantly influences

Table 1 Outer Loadings of the Measurement Model

| Construct | AVE | CR | Alpha | Range Outer Loadings |
|---|---|---|---|---|
| Top Management Support | 0.803 | 0.924 | 0.878 | 0.884 – 0.916 |
| Internal Communication | 0.787 | 0.917 | 0.866 | 0.836 – 0.933 |
| User Training | 0.812 | 0.928 | 0.884 | 0.888 – 0.920 |
| Project Risk Management | 0.819 | 0.932 | 0.891 | 0.893 – 0.914 |
| Information Quality | 0.789 | 0.918 | 0.867 | 0.873 – 0.909 |
| System Quality | 0.801 | 0.924 | 0.876 | 0.894 – 0.896 |
| Service Quality | 0.778 | 0.913 | 0.858 | 0.872 – 0.888 |
| Intention of Use | 0.745 | 0.898 | 0.829 | 0.855 – 0.870 |
| User Satisfaction | 0.774 | 0.911 | 0.854 | 0.849 – 0.903 |
| Net Benefits | 0.799 | 0.923 | 0.874 | 0.873 – 0.915 |

all three quality constructs ($\beta = 0.245–0.413$, all $p < 0.001$), emphasizing the role of structured learning programs in building user competence and confidence.

In the second stage of the model, all three quality dimensions—Information Quality, System Quality, and Service Quality—have significant effects on Intention to Use, with coefficients ranging from 0.278 to 0.345 (all $p < 0.001$). This finding indicates that improvements in system performance, data accuracy, and service responsiveness increase users' willingness to continue using the PAI system. System Quality ($\beta = 0.356$, $p < 0.001$) and Service Quality ($\beta = 0.236$, $p < 0.001$) also emerge as significant predictors of User Satisfaction, whereas Information Quality shows a weaker and non-significant path to satisfaction ($\beta = 0.123$, $p = 0.200$). This result aligns with recent observations that the quality of digital service delivery substantially shapes users' evaluations of system performance, particularly when service interactions serve as the primary touchpoint with the platform (Mustafa et al., 2020). Overall, this pattern suggests that users value technical reliability and support services more than informational attributes when forming overall satisfaction. A similar tendency is observed in studies of Indonesian digital-service environments, where system and service quality consistently emerge as the strongest predictors of user satisfaction and continued system use (Millenia et al., 2022).

Interestingly, the path from Intention to Use to User Satisfaction ($\beta = 0.142$, $p = 0.148$) is not statistically significant, suggesting that the willingness or motivation to continue using the system does not automatically lead to greater satisfaction. This finding highlights an important behavioral distinction between users' intentions and their actual emotional or cognitive evaluations of the system. It implies that satisfaction is shaped more by users' direct experiences with system quality and service performance than by their prior intention to use. In other words, employees may be willing to use the PAI platform due to work obligations or managerial directives; however, such usage alone does not guarantee positive perceptions unless it is accompanied by tangible improvements in usability, responsiveness, and reliability. This observation aligns with prior research emphasizing that sustained system adoption requires perceived value and consistent quality reinforcement to maintain user satisfaction over time.

Finally, both Intention to Use ($\beta = 0.532$, $p < 0.001$) and User Satisfaction ($\beta = 0.309$, $p < 0.001$) show significant effects on Net Benefits, reinforcing their pivotal mediating roles within the integrated model. These results indicate that the success of system integration projects depends not only on technical implementation but also on how effectively users engage with and perceive value from the system. When users consistently experience efficiency, accuracy, and support in their interactions, their satisfaction tends to enhance organizational performance outcomes such as productivity gains, reduced administrative errors, and improved decision-making processes. This relationship underscores the interconnected nature of technical quality, user perception, and business impact, illustrating how well-designed information systems translate managerial and operational improvements into measurable benefits. Therefore, strengthening both user intention and satisfaction remains a central focus for organizations seeking to maximize the long-term returns of their digital integration initiatives.

The structural model achieves strong explanatory power, with $R^2$ values of 0.69 for Information Quality, 0.72 for System Quality, 0.74 for Service Quality, 0.65 for Intention to Use, 0.61 for User Satisfaction, and 0.73 for Net Benefits. These values indicate that the combined D&M–CSF framework successfully captures the major determinants of both user-level and organizational success in an integrated information system. The detailed results of hypothesis testing and path coefficients are presented in Table 2, which summarizes the structural relationships among all constructs in the model.

As shown in Table 2, the structural model demonstrates that the managerial and technical dimensions of the proposed framework are strongly interrelated. PRM emerges as a consistently significant predictor across all quality dimensions—Information Quality, System Quality, and Service Quality—highlighting the critical role of proactive governance in ensuring successful system implementation. The strong path coefficients suggest that systematic risk identification, mitigation planning, and continuous monitoring not only prevent project delays but also enhance users' trust in the system's reliability and responsiveness. In this context, risk management functions as an enabler of quality assurance rather than merely a compliance exercise.

Similarly, Top-Management Support shows substantial effects on System Quality and Service Quality, indicating that leadership commitment is essential for sustaining system performance and service excellence. Executive involvement helps ensure adequate resource allocation, effective communication across departments, and the prioritization of integration initiatives within the organizational strategy. Interestingly, while the impact of top management on Information Quality remains significant, its magnitude is lower than its influence on the other two quality dimensions. This finding implies that top management's attention is often directed toward system stability and service delivery, whereas detailed aspects of data accuracy and informational completeness are managed primarily at the operational level.

The findings highlight the essential role of managerial involvement in shaping technical outcomes within an integrated information system. PRM consistently emerges as a significant determinant of all three quality dimensions—Information Quality, System Quality, and Service Quality. This result indicates that proactive risk identification, mitigation planning, and continuous monitoring are not merely

administrative routines but key mechanisms for ensuring system reliability, data accuracy, and responsive services. When risk-management practices are executed effectively, they yield tangible improvements that system users clearly recognize.

TMS likewise shows strong positive effects on System Quality and Service Quality, underscoring the importance of executive leadership in setting strategic direction, allocating resources, and legitimizing project priorities. Although its influence on Information Quality is also significant, the effect size is comparatively weaker. This pattern suggests that top management concentrates more on system stability and service responsiveness than on the completeness or accuracy of informational outputs.

Both IC and UT demonstrate significant impacts on Information Quality. This finding underscores the importance of clear knowledge sharing, well-defined procedures, and structured learning programs in maintaining the accuracy and timeliness of system outputs. Their relatively weaker influence on System Quality and Service Quality suggests that communication and training efforts are not yet fully aligned with technical development and service delivery. This gap indicates opportunities to better integrate organizational routines with system performance and service outcomes.

Among the quality constructs, Information Quality fails to significantly predict User Satisfaction, and Intention to Use also shows no significant effect on User Satisfaction. These results differ from the classical expectations of the D&M model, which generally assumes that information accuracy and behavioral intention contribute to user satisfaction. Comparable evidence is reported in evaluations of the SAKTI financial application, where accurate and timely information does not automatically increase satisfaction because users place greater emphasis on service quality and tangible benefits in daily operations (Mu & Metalica, 2022). Similarly, the absence of a significant relationship between Intention to Use and User Satisfaction aligns with the findings of Wagiman, Aspasya, and Prawati (2023), who observe that future usage intentions often reflect behavioral tendencies rather than current experiential satisfaction, which is more strongly driven by system performance and

Table 2 Structural Model Results (Inner Model)

| Hypotheses | | Path Coefficient | T-Statistics | P-Value | Result |
|---|---|---|---|---|---|
| H1 | Top Management Support → Information Quality | 0.286 | 4.000 | 0.000 | Significant |
| H2 | Top Management Support → System Quality | 0.448 | 7.608 | 0.000 | Significant |
| H3 | Top Management Support → Service Quality | 0.338 | 5.408 | 0.000 | Significant |
| H4 | Internal communication → Information Quality | 0.517 | 8.919 | 0.000 | Significant |
| H5 | Internal Communication → System Quality | 0.437 | 7.640 | 0.000 | Significant |
| H6 | Internal Communication → Service Quality | 0.444 | 7.619 | 0.000 | Significant |
| H7 | User Training → Information Quality | 0.413 | 5.415 | 0.000 | Significant |
| H8 | User Training → System Quality | 0.245 | 3.767 | 0.000 | Significant |
| H9 | User Training → Service Quality | 0.273 | 3.882 | 0.000 | Significant |
| H10 | Project Risk Management → Information Quality | 0.263 | 4.195 | 0.000 | Significant |
| H11 | Project Risk Management → System Quality | 0.357 | 5.799 | 0.000 | Significant |
| H12 | Project Risk Management → Service Quality | 0.438 | 7.486 | 0.000 | Significant |
| H13 | Information Quality → Intention of Use | 0.310 | 4.153 | 0.000 | Significant |
| H14 | Information Quality → User Satisfaction | 0.123 | 1.281 | 0.200 | Not Significant |
| H15 | System Quality → Intention of Use | 0.345 | 5.115 | 0.000 | Significant |
| H16 | System Quality → User Satisfaction | 0.356 | 4.237 | 0.000 | Significant |
| H17 | Service Quality → Intention of Use | 0.278 | 4.011 | 0.000 | Significant |
| H18 | Service Quality → User Satisfaction | 0.236 | 2.759 | 0.000 | Significant |
| H19 | Intention of Use → User Satisfaction | 0.142 | 1.446 | 0.148 | Not Significant |
| H20 | Intention of Use → Net Benefits | 0.532 | 7.894 | 0.000 | Significant |
| H21 | User Satisfaction → Net Benefits | 0.309 | 4.453 | 0.000 | Significant |

service quality. In the context of PT XYZ, these results imply that users prioritize stable operations and responsive support services over informational attributes when forming satisfaction judgments, and that a willingness to continue using the system does not necessarily translate into higher satisfaction unless clear improvements in quality are experienced.

Building on these findings, the observed lack of significant relationships is better understood within the context of mandatory system usage. In such environments, users tend to regard information accuracy and completeness as basic operational requirements rather than elements that directly enhance satisfaction, and therefore place greater emphasis on the system's ability to support daily work processes reliably. This interpretation aligns with Omari's (2025) findings, which show that Information Quality does not significantly influence User Satisfaction in a mandatory e-learning context, where satisfaction is primarily shaped by system reliability and service support. A comparable pattern is evident in the relationship between Intention to Use and User Satisfaction. Rabih and Yammine (2025) demonstrate that in compulsory usage settings, intention to use does not serve as a meaningful antecedent of satisfaction, as continued usage is largely driven by institutional obligations rather than voluntary choice. Under such conditions, behavioral intention reflects compliance with organizational requirements rather than a positive evaluative response to the system. Accordingly, in the application integration context of PT XYZ, where system usage is operationally required, User Satisfaction is more likely to be influenced by experienced system stability and service responsiveness than by informational attributes or users' stated intentions to continue using the system.

Based on these findings, PT XYZ is encouraged to reinforce executive involvement not only in funding and policy formulation but also in the active monitoring of information accuracy, so that managerial influence extends across all dimensions of system quality. Strengthening user-training programs is also essential to cultivate deeper technical competence among employees and to increase awareness of information-quality requirements. In addition, improving cross-division communication helps ensure that system updates and procedural adjustments contribute not only to technical performance but also to the accuracy and consistency of informational outputs. Lastly, integrating risk-management activities with system development and operational monitoring creates more visible improvements in system reliability and service continuity, thereby enhancing users' overall experience with the integrated platform.

By integrating the D&M success model with the CSF framework, this research offers a broader perspective for evaluating the achievement of integrated information systems. This combined lens allows the analysis to reflect not only how well the system performs from a technical standpoint but also how prepared the organization is to support and sustain it. The results provide useful guidance for PT XYZ and other financial institutions pursuing similar digital-integration efforts, while also contributing to academic discourse by illustrating how managerial practices influence system quality and generate organizational benefits.

## IV. CONCLUSIONS

This study assesses the efficacy of the PAI initiative implemented within PT XYZ by leveraging an integrative framework that combines the D&M Information System Success Model with a set of CSFs. Empirical data are derived from a structured questionnaire administered to a stratified sample of 120 active users and are analyzed using PLS-SEM. The findings reveal that sustained executive sponsorship, purposeful internal communication, comprehensive user training, and robust project risk management constitute key determinants of system quality, information integrity, and service responsiveness. Subsequent enhancements in these dimensions exert a significant positive influence on users' continuance intention, subjective satisfaction, and perceived organizational benefits, thereby confirming the predictive capacity of the hybrid framework.

Conceptually, the present contribution extends the established D&M model by explicitly positioning CSFs as an independent category closely linked to managerial decision-making processes, thereby redirecting the conventional focus from purely technical properties to user appraisal. By recasting CSFs—namely unwavering top-management endorsement, structured communication, comprehensive training, and proactive risk management—as foundational institutional drivers of information, system, and service quality, the model eschews the relegation of managerial action to a purely moderating role and instead positions it as a direct and generative mechanism shaping system performance. This recalibration provides a more nuanced explanation of how leadership commitment and institutional preparedness operate as causal forces underlying system success. Strengthened by this operational specification, the revised schema enhances predictive fidelity. It articulates a coherent agenda for subsequent empirical inquiry, including the examination of additional contextual variables such as change management practices and cultural acclimatization, which may further elucidate the determinants of success in complex systems integration initiatives.

From a practical standpoint, the empirical findings offer actionable guidance for organizations undertaking analogous digital integration initiatives. At PT XYZ, the outcomes underscore the necessity for chief officers to sustain hands-on oversight well beyond initial policy endorsement and budget allocation. Ongoing evaluation of data accuracy and overall system performance is required to prevent latency and ensure continuous value realization. Cross-divisional communication must likewise

remain consistent and timely, enabling procedural updates and risk-mitigation strategies to be uniformly disseminated and enacted. Regularly scheduled and systematically designed user training programs are essential to enhance operational competence, reduce erroneous transactions, and reinforce user confidence. In parallel, risk management is embedded not only during system development but also within routine operational activities, thereby safeguarding platform integrity and maintaining transactional continuity. Adherence to these managerial practices enables PT XYZ and comparable financial institutions to strengthen system robustness, alleviate user-related challenges, and fully leverage the organizational benefits of integrated information platforms.

Theoretical insights and practical implications are articulated to emphasize the dual value of the integrated D&M–CSF framework. By delineating the interdependencies between technical system attributes and managerial success factors, the model advances scholarly discourse while simultaneously serving as a strategic reference for executive and operational decision-makers. In doing so, it adds conceptual depth to the information systems success literature. It provides a structured lens through which organizations navigate the complexities of large-scale application integration initiatives.

Despite the contributions outlined above, this study has several limitations, particularly the use of cross-sectional data and the focus on a single organizational setting, which may limit the broader applicability of the findings. These constraints restrict the ability to capture dynamic changes in user perceptions and system performance over time and to generalize the results across different institutional environments. Therefore, future studies are encouraged to examine the proposed framework across multiple organizational contexts or to adopt a longitudinal research approach to better capture how application integration success evolves over time.

## AUTHOR CONTRIBUTIONS

Conceived and designed the analysis; Collected the data; Contributed data or analysis tools; Performed the analysis; Wrote the paper, A. A. P. H.; Other contribution, T. O.

## DATA AVAILABILITY

The data that support the findings of this study are openly available in Zenodo at http://doi.org/10.5281/zenodo.17218739, reference number 17218739.

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