

The Evaluation of SAP ERP Implementation using ISSM (Study Case: Managed Service Provider Company)

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ABSTRACT

This study aims to evaluate the success of SAP ERP implementation using the Information Systems Success Model (ISSM), in which the Intention to Use/Use construct is adapted into Perceived Usefulness as the SAP ERP is already fully operational within the company's daily business processes. Data were collected through a quantitative survey of SAP ERP users and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. The results show that System Quality, Information Quality, and Service Quality have positive and significant effects on Perceived Usefulness and User Satisfaction. Perceived Usefulness has positive and significant effect on User Satisfaction, and User Satisfaction also has positive and significant effect on Net Benefit. All eight hypotheses were supported. Among the tested relationships, User Satisfaction has the strongest direct effect on Net Benefit. These findings suggest the management maintain User Satisfaction while improving Information Quality and Perceived Usefulness through better data quality, user training, and user socialization, supported by regular monitoring of System Quality and Service Quality.

INTRODUCTION

As information technology evolves and digitalization expands across business sectors, organizations are increasingly motivated to streamline operations and foster seamless functional collaboration. Digital transformation has also encouraged organizations to integrate their business processes through information technology that supports automation, data integration, and decision-making.

One outcome of this shift is Enterprise Resource Planning (ERP), a unified platform that allows organizations to manage and align their processes (Shish & Shafa, 2023). Through ERP, previously separate business functions can be integrated within a single system, which in turn facilitates smoother information flow and strengthens coordination across organizational activities (Sologia et al., 2024; Tuli & Kaluvakuri, 2022).

This study focuses a Managed Service Provider company that adopted an SAP-based ERP system to streamline and integrate its core operational activities. SAP ERP was fully implemented in January 2025 and has been used in daily operations for approximately one year. However, the company continues to receive requests related to user assistance and system enhancement, indicating the need to evaluate whether the implementation has successfully supported users and delivered the expected benefits.

Based on internal data from January to June 2026, many of the issues reported by users were related to user guidance (50%), followed by requests for system enhancements (25%), data inconsistencies (15%), and system bugs or errors (10%). The prevalence of requests for user guidance indicates that, one year after the SAP ERP implementation, users still require assistance to utilize the system's features optimally. Meanwhile, the presence of requests for enhancements, data inconsistencies, and bugs or errors indicates that further refinement and adjustment are still required.

Such conditions underscore the need to evaluate SAP ERP implementation through the lens of its users. Specifically, an assessment of system quality, information quality, and service quality is required to determine whether these dimensions adequately address user needs and ultimately generate net benefits for both individual and organizational level.

One framework commonly applied to assess information system success is the Information Systems Success Model (ISSM). This model posits that information system success is influenced by System Quality, Information Quality, Service Quality, Intention to Use/Use, and User Satisfaction, which in turn impact Net Benefit. In this study, the Intention to Use/Use variable within the ISSM was adapted to Perceived Usefulness. This adjustment was made to ensure that the research focuses more on the benefits of the system as perceived by users rather than on the intensity of system usage.

This study provides contributions to the ISSM literature. First, this study is situated in a post-implementation setting, it centers on users' perceived usefulness rather than their initial intention or willingness to adopt the system. Second, this study uses Importance-Performance Map Analysis (IPMA) to identify which factors are more important and which areas need more attention

from the company. This provides additional information that can support managerial decision-making.

This study investigates how System Quality, Information Quality, and Service Quality influence Perceived Usefulness and User Satisfaction, how Perceived Usefulness in turn affects User Satisfaction, and how User Satisfaction ultimately shapes Net Benefit.

THEORETICAL REVIEW

Enterprise Resource Planning

Enterprise Resource Planning (ERP) is an integrated information system used to manage and connect various business functions within an organization through a single, unified platform. The system allows data from different business processes to be managed within an integrated system, making information more accessible and supporting coordination among departments (Tuli & Kaluvakuri, 2022).

Information Systems Success Model (ISSM)

As the one of the most frequently applied frameworks for assessing information system success, the ISSM captures not only a system's technical dimensions but also how it is used, how users perceive it, and the impact that follow from its use (Al-Okaily et al., 2023).

System Quality concerns the technical performance of an information system, encompassing attributes such as reliability, ease of use, flexibility, and speed of access (Al-Okaily et al., 2023).

Information Quality pertains to the standard of output an information system produces, with accuracy, relevance, completeness, and timeliness representing its key attributes (Al-Okaily et al., 2023).

Service Quality reflects the quality of support and services provided to system users. It includes aspects such as training, technical support, responsiveness, and empathy (Syah, 2016; Urbach & Müller, 2012).

In this study, the Intention to Use/Use construct in the original ISSM is adapted into Perceived Usefulness. Perceived Usefulness describes the extent to which users perceive that the system helps them complete their work more effectively, improve productivity, accelerate work processes, and support the achievement of work objectives (Rafique et al., 2020; Rezvani et al., 2022).

User Satisfaction refers to the level of satisfaction users experience when using an information system, including their perceptions of the system and the quality of information it provides (Al-Okaily et al., 2023).

Net Benefit refers to the overall benefits obtained by individuals and organizations from the use of an information system. In the ISSM, Net Benefit can be represented through Individual Impact and Organizational Impact (Akrong et al., 2022).

Based on the theoretical review and previous research, the hypotheses proposed in this study are as follows:

H1: System Quality has a positive effect on Perceived Usefulness

H2: Information Quality has a positive effect on Perceived Usefulness

- H3: Service Quality has a positive effect on Perceived Usefulness
H4: System Quality has a positive effect on User Satisfaction
H5: Information Quality has a positive effect on User Satisfaction
H6: Service Quality has a positive effect on User Satisfaction
H7: Perceived Usefulness has a positive effect on User Satisfaction
H8: User Satisfaction has a positive effect on Net Benefit

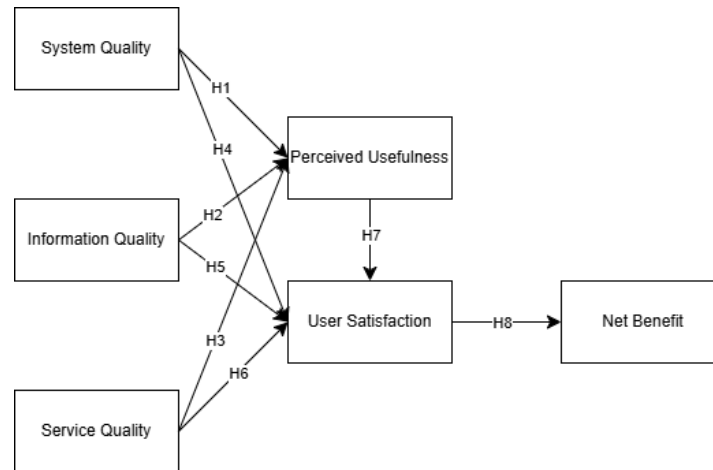


Figure 1. Conceptual Model

METHODOLOGY

A quantitative, causal research design was employed to test the effects of System Quality, Information Quality, and Service Quality on Perceived Usefulness and User Satisfaction, as well as the subsequent effect of User Satisfaction on Net Benefit, drawing on an ISSM framework adapted to the SAP ERP context. A causal rather than merely descriptive design was selected because the study aims to verify the hypothesized relationship among constructs, using a cross-sectional survey administered at one point in time. Data collected relied on a questionnaire employing a 1-5 Likert scale, distributed to SAP ERP users who constituted the unit analysis.

The population of this study comprises 250 SAP ERP users. Based on the Krejcie and Morgan approach, the minimum required sample size for a population of 250 was approximately 152 respondents. To ensure that the required number of valid responses could be obtained, questionnaire were distributed to 200 eligible SAP ERP users, ultimately yielding 162 valid responses for analysis. Respondents were selected through purposive sampling, targeting individuals who met the study's eligibility criteria and had hands-on experience operating the SAP ERP system as part of their daily tasks.

Table 1. Operational Variabel

Variable	Item	Indicator	Scale
System Quality (Akrong et al., 2022)	SQ01	Ease of system use	Likert 1-5
	SQ02	Suitability of system features	
	SQ03	System speed in supporting work	
	SQ04	System availability during use	
Information Quality (Akrong et al., 2022)	IQ01	Availability of information	Likert 1-5
	IQ02	Relevance of information	
	IQ03	Reliability of information	
	IQ04	Security of information access	
	IQ05	Timeliness of information	
Service Quality (Akrong et al., 2022)	SV01	Technical support for system	Likert 1-5
	SV02	Reliability of system service	
Perceived Usefulness (Rafique et al., 2020)	PU01	Facilitates access to work tasks	Likert 1-5
	PU02	Improve work performance	
	PU03	Facilitates information seacrh	
	PU04	Improbes work effectiveness	
	PU05	System is useful for work	
User Satisfaction (Akrong et al., 2022)	US01	Satisfaction with system functions	Likert 1-5
	US02	System helps the work process	
	US03	Adequate support for system use	
	US04	Overall satisfaction with system use	
Net Benefit - Individual Impact (Akrong et al., 2022)	II01	Improved work performance	Likert 1-5
	II02	Improved work effectiveness	
	II03	Time efficiency at work	
Net Benefit - Organizational Impact (Akrong et al., 2022)	OI01	Simplification of organizational work processes	Likert 1-5
	OI02	Improved departmental service	
	OI03	Ease of organizational information exchange	

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. The analysis included the evaluation of the measurement model (outer model), the evaluation of the structural model (inner model), and Importance-Performance Map Analysis (IPMA). Assessment of the measurement model drew on four criteria, indicator reliability (outer loading ≥ 0.70), convergent validity ($AVE \geq 0.50$), internal consistency reliability (Cronbach's Alpha and Composite Reliability ≥ 0.70), and discriminant validity ($HTMT < 0.90$). The structural model, meanwhile, was examinde through path coefficients, the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2), hypotheses tested through a bootstrapping procedure at a 5% significance level (T-Statistic > 1.96 ; P-Value < 0.05). Descriptive statistical

analysis was also conducted to describe the characteristics of the respondents and their responses to the research variables.

RESULTS

Respondent Profile

Of the 200 questionnaires distributed, 162 valid responses were retained for analysis. The respondents came from various divisions within the organizations, with the largest proportions from Technical Support (12.96%) and Inventory (9.26%). Regarding the duration of ERP usage, most respondents (66.67%) had used SAP ERP for 1-3 years, followed by those with less than one year of usage (29.0%) and those with more than three years of usage (4.32%).

Descriptive Analysis of Variables

As presented in Table 2, every research variable fell into the “high” category, with mean scores clustering narrowly between 3.48 and 3.50 on the 1-5 scale.

Table 2. Summary of Descriptive Statistics of Research Variables

Variable	Mean	Category
System Quality	3.48	High
Information Quality	3.50	High
Service Quality	3.48	High
Perceived Usefulness	3.49	High
User Satisfaction	3.50	High
Net Benefit (Individual Impact)	3.48	High
Net Benefit (Organizational Impact)	3.51	High

These results indicate that, in general, users had positive perceptions of SAP ERP implementation. Descriptive statistics alone, however, cannot confirm the quality of the measurement instruments or reveal the relationships between variables, which requires further inferential testing.

Measurement Model (Outer Model) Evaluation

Outer model testing was conducted through indicator reliability, convergent validity, discriminant validity, and internal consistency reliability. The initial results showed that all indicators met the outer loading criterion of ≥ 0.70 ; however, the Heterotrait-Monotrait (HTMT) ratio between User Satisfaction and Net Benefit reached 0.918, surpassing the acceptable cut-off for discriminant validity. Therefore, the US04 indicator of the User Satisfaction construct was removed (trimmed), resulting in three remaining indicators (US01-US03).

After the trimming process, all indicators had outer loadings ranging from 0.757 to 0.927 (Valid), the AVE values of all constructs were above 0.50 ranging from 0.663 to 0.836, and the Cronbach’s Alpha and Composite Reliability values of all constructs were above 0.70, as presented in Table 3. Discriminant validity was further confirmed through the Fornell-Larcker criterion, cross-loading, and HTMT, with the highest HTMT value being 0.880 between User Satisfaction and

Net Benefit. Thus, all constructs demonstrated adequate convergent validity, discriminant validity, and internal consistency reliability.

Table 3. Results of Convergent Validity and Reliability

Construct	AVE	Cronbach's Alpha	Composite Reliability
System Quality	0.725	0.874	0.885
Information Quality	0.741	0.912	0.917
Service Quality	0.836	0.805	0.806
Perceived Usefulness	0.739	0.912	0.912
User Satisfaction	0.817	0.888	0.890
Net Benefit	0.663	0.898	0.900

Structural Model (Inner Model) Evaluation and Hypothesis Testing

Hypothesis testing was conducted through the bootstrapping procedure. Table 4 showed the results that all eight hypotheses were supported, with T-Statistic values > 1.96 and P-Values < 0.05.

Table 4. Hypothesis Results

Hypothesis	Path	Path Coefficient	T-Statistic	P-Value	Conclusion
H1	System Quality → Perceived Usefulness	0.458	8.895	0.000	Supported
H2	Information Quality → Perceived Usefulness	0.522	10.698	0.000	Supported
H3	Service Quality → Perceived Usefulness	0.312	6.416	0.000	Supported
H4	System Quality → User Satisfaction	0.168	2.588	0.005	Supported
H5	Information Quality → User Satisfaction	0.229	3.342	0.003	Supported
H6	Service Quality → User Satisfaction	0.171	2.739	0.003	Supported
H7	Perceived Usefulness → User Satisfaction	0.439	5.357	0.000	Supported
H8	User Satisfaction → Net Benefit	0.787	29.612	0.000	Supported

The R² results place the explanatory power of the model at 59.8% for Perceived Usefulness, 53.3% for User Satisfaction, and 62.0% for Net Benefit, all falling in the moderate range. The effect size (f²) test shows the largest influence of the User Satisfaction on Net Benefit relationship (f² = 1.630, large), followed by

Information Quality on Perceived Usefulness ($f^2 = 0.676$, large) and System Quality on Perceived Usefulness ($f^2 = 0.520$, large). The predictive relevance (Q^2) testing shows that all endogenous variables have Q^2 values greater than 0, ranging from 0.432 to 0.582, indicating good predictive relevance of the model.

Importance-Performance Map Analysis (IPMA)

As shown in Tabel 5, the IPMA conducted for Net Benefit identifies User Satisfaction as the construct with both the highest importance score (0.787) and the highest performance score (54.011). Information Quality follows with an importance value of 0.361 and performance value of 49.827, while Perceived Usefulness, System Quality, and Service Quality have lower importance and performance values.

Table 5. IPMA Results

Construct	Importance	Performance
User Satisfaction	0.787	54.011
Information Quality	0.361	49.827
Perceived Usefulness	0.346	49.793
System Quality	0.290	49.345
Service Quality	0.242	49.148

These findings are consistent with the company's internal data from January to June 2026, where the primary issues reported by users were related to user guidance (50%) and data inconsistencies (15%). This finding provides contextual support for the need to further improve user guidance and information quality, particularly given the importance of Information Quality and Perceived Usefulness in the structural model.

DISCUSSION

The Effect of System Quality on Perceived Usefulness (H1)

System Quality has a positive and significant effect on Perceived Usefulness, indicating that the better the quality of the SAP ERP system quality is associated with higher users' perceptions of the system's usefulness. These findings are consistent with Rezvani et al. (2022). Akrong et al. (2022) also found a positive influence of System Quality on Use, reinforcing the relevance of System Quality as an important predictor regardless of the mediating construct used. This finding suggests that, even after SAP ERP has been in use for approximately one year, users' perceptions of its usefulness are still influenced by the system's ongoing technical performance rather than only by their initial experience with the system. In other words, in the post-implementation stage, users continue to evaluate the usefulness of SAP ERP based on their daily experience with its ease of use, reliability, and flexibility.

The Effect of Information Quality on Perceived Usefulness (H2)

Information Quality has a positive and significant effect on Perceived Usefulness, indicating that the accuracy, completeness, relevance, and timeliness

of system information contribute to higher users' perceptions of the system's usefulness. These findings align with Akrong et al. (2022), who found that Information Quality significantly affects Use as a mediating construct, supporting the important role of Information Quality in shaping users' perceptions of the system, although the mediating construct differs between the two studies. This finding is also relevant to the context of this study, as the internal data showed that data inconsistency was one of the reported issues. The significant relationship between Information Quality and Perceived Usefulness suggests that users' perceptions of the usefulness of SAP ERP are closely related to the quality of the information provided by the system. When information is inaccurate or incomplete, users may find the system less useful for supporting their daily work.

The Effect of Service Quality on Perceived Usefulness (H3)

Service Quality has a positive and significant effect on Perceived Usefulness, indicating that the quality of support services provided to users plays an important role in shaping their perceptions of the system's usefulness. These findings are consistent with Akrong et al. (2022), who found a positive effect of Service Quality on Use as the mediating construct. This finding is relevant to the context of the Managed Service Provider company, where technical support is an important part of daily operations. Therefore, the availability of responsive technical support may contribute to users' perceptions that SAP ERP is useful for supporting their work.

The Effect of System Quality on User Satisfaction (H4)

System Quality has a positive and significant effect on User Satisfaction, although the effect is relatively small compared to its effect on Perceived Usefulness. These findings differ from Akrong et al. (2022), who found an insignificant effect. This difference may be related to differences in the research context and model structure. In this study, System Quality is hypothesized to influence User Satisfaction directly, while Perceived Usefulness is examined as a separate predictor of User Satisfaction. The significant relationship between System Quality and Perceived Usefulness also indicates that users' perception of the system's technical quality are related to their perceptions of its usefulness. In the context of Managed Service Provider company, users have been using SAP ERP for approximately one year, allowing them to experience its reliability and performance in their daily work. This may explain why System Quality has a significant, although relatively small, direct on User Satisfaction in this study.

The Effect of Information Quality on User Satisfaction (H5)

Information Quality has a positive and significant effect on User Satisfaction, which differs from the findings of Akrong et al. (2022), who reported an insignificant effect. This difference may be related to variations in the research context and model structure. In their study, Information Quality was directed to influence use and Individual Impact directly, while the relationship between Information Quality and User Satisfaction was not the primary pathway

examined in the same manner as in this study. In contrast, this study demonstrates that Information Quality has a significant direct effect on User Satisfaction, while it also has a significant effect on Perceived Usefulness. This finding is also relevant to the internal data, where data inconsistency was one of the reported issues. This suggests that information problems may affect not only users' perception of the usefulness of the system but also their overall satisfaction with SAP ERP. This finding highlights the importance of accurate, complete, relevant, and timely information in shaping users' satisfaction with SAP ERP.

The Effect of Service Quality on User Satisfaction (H6)

Service Quality has a positive and significant effect on User Satisfaction, which differs from the finding of Akrong et al. (2022), who reported that Service Quality did not have a significant effect on User Satisfaction. This difference may be attributed to differences in the research context and model structure. In their study, the effect of Service Quality was more strongly emphasized on Use, whereas in this study, Service Quality has a significant direct effect on User Satisfaction, while it also has a significant effect on Perceived Usefulness. This finding indicates that the availability of adequate support, user training, technical assistance, and responsive services may contribute to users' satisfaction with the SAP ERP system.

The Effect of Perceived Usefulness on User Satisfaction (H7)

Perceived Usefulness has a positive and significant effect on User Satisfaction, consistent with the findings of Rezvani et al. (2022). These findings indicate that users' perceptions of the system's usefulness are associated with higher levels of User Satisfaction. This relationship suggests that when users perceive SAP ERP as useful for completing their tasks, improving productivity, and supporting their work objectives, their satisfaction with the system tends to be higher. This finding is also consistent with the results of H1-H6, where System Quality, Information Quality, and Service Quality were found to have positive and significant effects on Perceived Usefulness and User Satisfaction. In the post-implementation context of this study, Perceived Usefulness therefore remains an important factor in shaping users' satisfaction with SAP ERP, even though the system has been routinely used in daily work activities.

The Effect of User Satisfaction on Net Benefit (H8)

User Satisfaction has a positive and significant effect on Net Benefit and represents the strongest direct predictor of Net Benefit in this study. However, this finding differs from Akrong et al. (2022), who reported a negative effect on Individual Impact. This difference may be attributed to differences in the research context and model structure. In their study, Individual Impact was predicted by five variables simultaneously, whereas in this study, User Satisfaction is positioned as the sole direct predictor of Net Benefit. In this study, Net Benefit represents the benefits perceived by users and the organization through Individual Impact and Organizational Impact. Therefore, the positive relationship between User Satisfaction and Net Benefit indicates that higher user satisfaction with SAP ERP is associated with greater perceived benefits at both

the individual and organizational levels. The strong relationship found in this study is also consistent with the IPMA results, where User Satisfaction shows the highest level of importance and performance. This highlights the importance of maintaining user satisfaction as part of the ongoing evaluation of SAP ERP implementation.

CONCLUSIONS AND RECOMMENDATIONS

This study evaluates the success of SAP ERP implementation at a Managed Service Provider using the ISSM framework. Measurement model testing confirmed that all indicators satisfy validity and reliability standards. The structural model also demonstrates good predictive capability, with the strongest influence observed in the relationship between User Satisfaction and Net Benefit.

Hypothesis testing results indicate that System Quality, Information Quality, and Service Quality have a positive and significant effect on both Perceived Usefulness (H1, H2, H3) and User Satisfaction (H4, H5, H6). Perceived Usefulness was also found to have a positive and significant effect on User Satisfaction (H7), and User Satisfaction positive and significant effect on Net Benefit (H8). Consequently, all hypotheses in this study are supported. Furthermore, the Importance-Performance Map Analysis reveals that User Satisfaction exhibits the highest level of both importance and performance. Conversely, while Information Quality and Perceived Usefulness show high importance, their performance remains below average, indicating areas that require improvement in the SAP ERP implementation.

Based on these results, the company is advised to prioritize User Satisfaction as a key factor in the successful implementation of SAP ERP, for instance by conducting periodic User Satisfaction evaluations. Information Quality and Perceived Usefulness require greater attention, such as through data quality improvements, user training and feature improvements, given their high importance despite currently suboptimal performance. Furthermore, System Quality and Service Quality should be regularly monitored to maintain the quality of the system and its supporting services.

FURTHER STUDY

Future research is advised to develop the model by incorporating other relevant variables. Expanding the number and diversity of respondents is also recommended to ensure the findings provide a more representative overview of the findings. Furthermore, a longitudinal approach could be considered to observe user perceptions regarding system quality, satisfaction, and perceived benefits as SAP ERP usage increases over time.

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