AJEMB
AMERICAN JOURNAL OF ECONOMIC AND MANAGEMENT BUSINESS

American Journal of Economic and Management Business
e-ISSN: 2835-5199
Vol. 4 No. 6 June 2025

Net Benefit Analysis of SAP Software Management Material Module Using Human Organization & Technology Model at PT Telkom Akses

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Abstract

This study evaluates the net benefits of the SAP Management Material Module at PT Telkom Akses using the Human, Organization, and Technology (HOT) Fit Model. The research aims to understand the impact of system quality, information quality, and service quality on net benefits through user satisfaction and organizational structure. The primary objective is to assess how these factors interact to enhance the effectiveness of the SAP system in inventory management. A quantitative survey involving 348 Warehouse PICs was conducted, and data were analyzed using Structural Equation Modeling (SEM) with SmartPLS software. The study found that all three factors—system quality, information quality, and service quality—positively impact net benefits through both user satisfaction and organizational structure, with significant support for all hypotheses tested. The findings suggest that improving technological infrastructure, user satisfaction, and organizational support are crucial for maximizing the SAP system's net benefits. These results have practical implications for organizations aiming to optimize their digital systems, especially in the context of the telecommunications industry. The study highlights the importance of a holistic approach to system implementation, involving both human and organizational factors, to ensure long-term success and operational efficiency.

Keywords: SAP; HOT-FIT Mode; Net Benefit; SEM; PT Telkom Akses

INTRODUCTION

The global telecommunications industry is undergoing rapid transformation, driven by technological advancements and shifts in digital consumption behavior (Weisberger, 2023). In Indonesia, internet penetration has grown significantly by 14.7% between 2018 and 2024, with the digital economy projected to reach a value of US$360 billion by 2030 (Rakhmayanti, 2024). However, the national telecommunications industry is entering a critical phase, experiencing slow growth at only 2.3% annually and facing pressure to undergo comprehensive strategic transformation (Fadilah, 2024).

Digital transformation has become imperative for enhancing competitiveness and operational efficiency (Ferdiansyah & Tricahyono, 2023). PT Telkom Indonesia, through its subsidiary PT Telkom Akses, has adopted a customer-oriented digital strategy and implemented the SAP ERP system since 2020 to support operational efficiency, particularly in inventory management (Riduan & Firdaus, 2024). Several key points to consider in the Material Management (MM) module include creating purchase requisitions, generating purchase orders, receiving goods, verifying supplier invoices,

managing inventory, and planning production, as well as setting minimum order limits through Material Requirements Planning (MRP) (Wijaya & Sadjiarto, 2014).

Nevertheless, the implementation of SAP still faces several challenges, including limited detail on material volume, difficulties in tracking vendor and brand information, and a user interface that lacks user-friendliness (Wachidah & Rahmawati, 2023). Issues such as discrepancies in stock opname results and manual data entry due to the system's lack of agility in adapting to operational dynamics adversely affect efficiency and the quality of information. These challenges directly impact service quality and the company's net benefit (Hidayat et al., 2025).

Indrawati et al. (2024) state that technology adoption is a complex process requiring a holistic approach. According to Noviaristanti and Rengganis (2023), digital transformation through information and communication technology (ICT) innovation plays a crucial role in improving the quality of public administrative services by making them faster, more transparent, and more efficient. The success of digital transformation implementation is significantly influenced by organizational factors that support such changes (Zhang et al., 2022). Additionally, the readiness and competence of human resources in operating digital systems are critical aspects that determine the success of the digitalization process (Danusaputro et al., 2024).

The Human Organization Technology FIT (HOT-FIT) model is a combination of the Information System Success Model developed by DeLone and McLean and the IT Organization Fit Model by Morton. HOT-FIT is a commonly used method for evaluating the implementation of systems within an institution (Tawar et al., 2022). According to Widyasari and Ridwan (2023), the HOT-FIT model comprises eight key components: system users and user satisfaction (Human), structure and environment (Organization), system quality, information quality, and service quality (Technology), and net benefits.

This study adopts the HOT-FIT model to evaluate the success of SAP implementation in inventory management at PT Telkom Akses. It examines several factors, aiming to provide solutions to current challenges and improve the effectiveness of digital transformation in the telecommunications sector. The following represents the conceptual framework used in this study, outlining the hypothesis flow as illustrated in the figure.

Several studies have investigated the impact of digital transformation on various industries, with a focus on enhancing operational efficiency (Ferdiansyah & Tricahyono, 2023). In particular, PT Telkom Indonesia has implemented the SAP ERP system to support inventory management and streamline operations. However, challenges persist in the effective use of the Material Management (MM) module, specifically issues like the system's user interface, data tracking, and limited adaptability to operational changes (Wachidah & Rahmawati, 2023).

Despite ongoing efforts, there is a lack of detailed studies examining the effectiveness of the SAP implementation specifically in the context of PT Telkom Akses, with limited focus on the impact of the Human Organization Technology (HOT-FIT) model for evaluating SAP's success in inventory management. Additionally, the

relationship between technological quality, organizational structure, and net benefits has yet to be fully explored in this sector.

The novelty of this study lies in adopting the HOT-FIT model to evaluate the success of SAP implementation in inventory management at PT Telkom Akses. The study explores the interaction between human, organizational, and technological factors to provide a comprehensive evaluation of SAP's net benefits, which has not been extensively studied within the Indonesian telecommunications context.

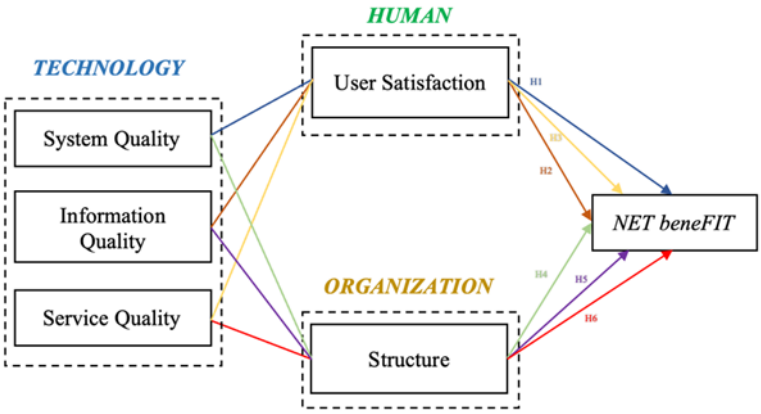

Figure 1. Research hypothesis
Source: Researcher

The following statements represent the research hypotheses formulated for this study:

1. H1: System Quality has a significant and positive influence on Net Benefit with User Satisfaction as an intervening variable.
2. H2: Information Quality has a significant and positive influence on Net Benefit with User Satisfaction as an intervening variable.
3. H3: Service Quality has a significant and positive influence on Net Benefit with User Satisfaction as an intervening variable.
4. H4: System Quality has a significant and positive influence on Net Benefit with Organizational Structure as an intervening variable.
5. H5: Information Quality has a significant and positive influence on Net Benefit with Organizational Structure as an intervening variable.
6. H6: Service Quality has a significant and positive influence on Net Benefit with Organizational Structure as an intervening variable.

RESEARCH METHODS

This study employs a quantitative approach with a causal research design. The population consists of 2,665 employees of PT Telkom Akses in the PIC Warehouse division who directly use the SAP software in the Material Management (MM) module. A total of 348 samples were selected proportionally from eight regional offices to ensure representative data distribution.

Primary data were collected through questionnaires distributed to employees managing the warehouse and using the SAP system, providing specific and relevant information for the study. Secondary data were gathered from company documents, annual reports, internal archives, official publications, and related statistical data. The use of both primary and secondary data offers a comprehensive and in-depth understanding of the company's condition, enhancing the accuracy and credibility of the research results.

Testing using PLS-SEM is conducted in two stages. The first stage involves evaluating the measurement model to ensure its reliability and validity. Once the measurement model is confirmed to be both valid and reliable, the next step is to assess the structural model. This approach aligns with Rahadi (2023), who emphasizes that structural model testing is only valid if the measurement model meets the required reliability and validity standards.

The first step in SEM is developing a diagram, commonly referred to as a path model, which represents the research hypotheses and illustrates the relationships among variables based on theory. The path model consists of two main components: the structural model, which shows the relationships among latent variables, and the measurement model, which depicts the relationships between latent variables and their indicators. In the structural model, two critical aspects must be considered—the sequence of constructs and the relationships between them—as these elements are closely tied to the theory being tested and the proposed hypotheses (Evi and Rachbini, 2022).

As stated by Rahadi (2023), the structural model evaluation involves three main steps. First, the significance of the relationships between constructs is assessed by examining path coefficients, which indicate the strength and direction of the relationships. These should align with the hypothesized theory and are tested for significance using t-values or critical ratios (CR) obtained through bootstrapping. Second, the R^2 value is analyzed to determine the extent to which exogenous variables explain the variance in endogenous variables. R^2 values are categorized as substantial (0.67), moderate (0.33), and weak (0.19). The effect size (f^2) is also calculated, with thresholds of 0.02 (small), 0.15 (medium), and 0.35 (large) to assess the impact of each exogenous variable. Third, the Q^2 predictive relevance test is used to validate the model, particularly for endogenous variables with reflective measurement models. A Q^2 value greater than 0 indicates that the exogenous variables have predictive relevance for the endogenous variables.

This study employs the t-test method with decision criteria based on Fitri et al. (2023): (1) if the probability value P ($T \leq t$) two-tailed is greater than 0.05, the null hypothesis (H_0) is accepted and the alternative hypothesis (H_1) is rejected; (2) if the probability value is less than 0.05, the alternative hypothesis (H_1) is accepted and the null hypothesis (H_0) is rejected.

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the relationships between variables. The analysis was conducted in two stages. First, the Measurement Model Evaluation was performed to assess the validity and reliability of the measurement model, ensuring that the indicators effectively represented the latent constructs. After the measurement model was validated, the

Structural Model Evaluation was conducted to examine the hypothesized relationships among the latent variables. This step involved evaluating the path coefficients, R^2 values, effect sizes (f^2), and predictive relevance (Q^2) for each construct. Additionally, a bootstrapping method was applied to test the significance of the relationships, further ensuring the robustness of the analysis.

RESULT AND DISCUSSION

Respondent Characteristics

The respondents in this study were employees of PT Telkom Akses serving as Warehouse PICs who use the SAP MM module. Primary data were collected through questionnaires. The sample size was determined using the Slovin formula, resulting in 348 respondents, with proportional distribution across the regional offices of PT Telkom Akses.

Table. 1 Respondent Characteristics

Characteristic	Criteria	Total	Percentage
Age	20-30 Years old	118	34%
	31-40 Years old	166	48%
	41-50 Years old	64	18%
	51-60 Years old	0	0
Gender	Women	121	65%
	Men	227	35%
Education	High School	47	14%
	Diploma 3	91	26%
	Diploma 4	64	18%
	Bachelor	117	34%
	Magister	29	8%
Years of service	< 5 Years	146	42%
	> 5 Years	202	58%
Work Location	Head Office	1	0,287%
	Regional 1	56	16,09%
	Regional 2	64	18,39%
	Regional 3	39	11,21%
	Regional 4	37	10,63%
	Regional 5	71	20,40%
	Regional 6	43	12,36%
	Regional 7	37	10,63%

Source: Researcher

The majority of respondents are aged between 31–40 years old (48%), followed by those aged 20–30 years (34%), and 41–50 years (18%). There are no respondents in the 51–60 age group. In terms of gender, women dominate the sample with 65%, while men make up 35%. Regarding educational background, most respondents hold a Bachelor's

degree (34%), followed by Diploma 3 (26%), Diploma 4 (18%), High School (14%), and a small proportion with a Master's degree (8%).

In terms of years of service, 58% of respondents have worked for more than 5 years, while 42% have worked for less than 5 years. As for work location, the respondents are fairly distributed across PT Telkom Akses regions, with the largest proportion in Regional 5 (20.40%), followed by Regional 2 (18.39%), Regional 1 (16.09%), Regional 6 (12.36%), Regional 3 (11.21%), Regional 4 and Regional 7 (each 10.63%). Only one respondent (0.287%) is from the Head Office.

Outer Model

The outer model in PLS-SEM describes the relationship between indicators (measurable variables) and latent constructs (variables that cannot be directly observed).

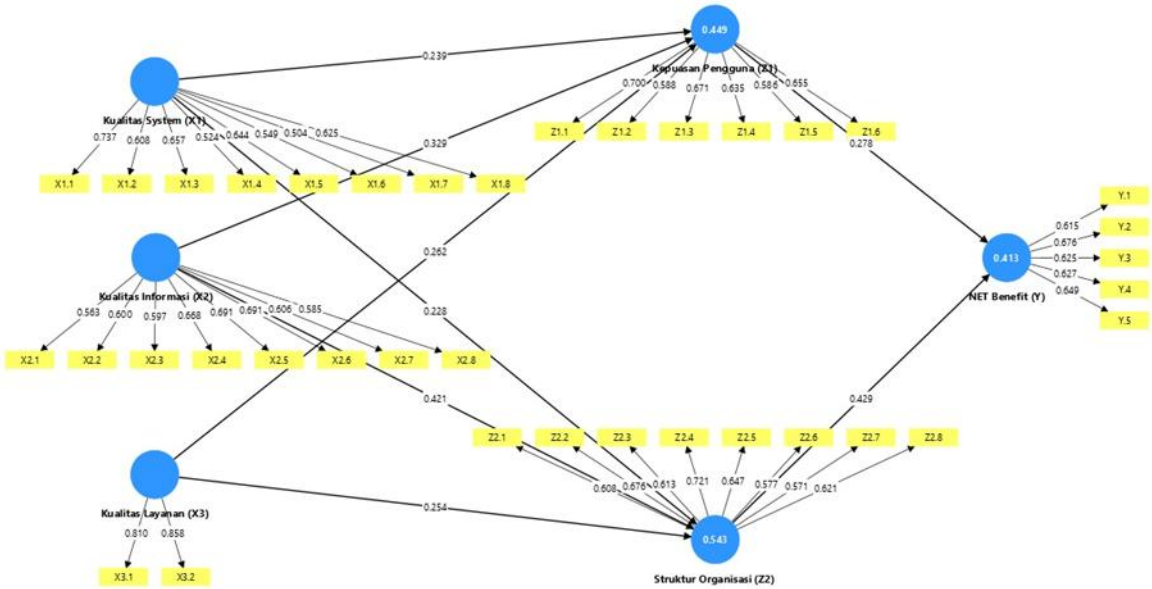

Figure 1. Outer Model Result Trough SmartPLS

Source: Researcher

All constructs in this model have demonstrated adequate convergent validity, as indicated by outer loading values mostly above 0.5. According to the minimum criteria proposed by Rahadi (2023), these loading values are acceptable and show that the indicators effectively represent the latent constructs being measured.

Inner Model

The inner model in PLS-SEM illustrates the relationships between latent constructs, representing the causal paths among the variables being tested. This model is used to examine the causal relationships and the predictive strength between constructs.

Table. 2 R^2 Inner Model

Variable	R-Square
User Satisfaction (Z1)	0.449
Net Benefit (Y)	0.413
Structure (Z2)	0.543

Source: Researcher

Based on the table above, it can be seen that the variable User Satisfaction (Z1), as an intervening variable, has a contribution value of 0.449 or 44.9%, which falls into the moderate category. This means that User Satisfaction accounts for 44.9% of the influence on other variables in the model, while the remaining 55.1% is explained by variables outside the scope of this study. Furthermore, the variable Net Benefit (Y), which serves as the endogenous latent variable, has a value of 0.413 or 41.3%, also categorized as moderate. This indicates that 41.3% of the variation in Net Benefit can be explained by the variables within the research model, whereas the remaining 58.7% is affected by factors not examined in this study.

Hypothesis T-Tests

The T-test in PLS-SEM is used to measure the significance of the relationships between latent constructs in the structural model. This test is conducted through bootstrapping, which generates t-statistic values. The table below presents the results of the T-test hypothesis testing

Table. 3 T-Test

Variable	T-Statistic	Finding
System Quality→ User Satisfaction → Net Benefit	2.747	Hypothesis accepted
Information Quality → User Satisfaction → Net Benefit	3.023	Hypothesis accepted
Service Quality → User Satisfaction → Net Benefit	2.991	Hypothesis accepted
System Quality → Structure→ Net Benefit	3.132	Hypothesis accepted
Information Quality → Structure → Net Benefit	5.690	Hypothesis accepted
Service Quality → Structure → Net Benefit	3.899	Hypothesis accepted

Source: Researcher

Based on the hypothesis testing results presented above, it can be concluded that all proposed hypotheses (H1–H6) are accepted, indicating significant indirect effects of System Quality, Information Quality, and Service Quality on Net Benefit through the mediating variables of User Satisfaction and Organizational Structure.

1. H1: System Quality has a significant and positive effect on Net Benefit through the mediating variable User Satisfaction (t-statistic = 2.747 > 1.96).
2. H2: Information Quality has a significant and positive effect on Net Benefit through the mediating variable User Satisfaction (t-statistic = 3.023 > 1.96).
3. H3: Service Quality has a significant and positive effect on Net Benefit through the mediating variable User Satisfaction (t-statistic = 2.991 > 1.96).
4. H4: System Quality has a significant and positive effect on Net Benefit through the mediating variable Organizational Structure (t-statistic = 3.132 > 1.96).
5. H5: Information Quality has a significant and positive effect on Net Benefit through the mediating variable Organizational Structure (t-statistic = 5.690 > 1.96).
6. H6: Service Quality has a significant and positive effect on Net Benefit through the mediating variable Organizational Structure (t-statistic = 3.899 > 1.96).

CONCLUSION

The hypothesis testing confirmed that all proposed hypotheses (H1–H6) were accepted, demonstrating significant influences of system quality, information quality, and service quality on Net Benefit through both user satisfaction (H1–H3: T-statistics 2.747–3.023) and organizational structure (H4–H6: T-statistics 3.132–5.690). These findings underscore that optimal system performance, accurate information delivery, and reliable service—supported by robust organizational infrastructure—are critical for maximizing SAP's net benefits in inventory management. For future research, expanding this HOT-FIT framework to other ERP modules (e.g., finance or HR) across diverse telecommunications subsidiaries could validate model generalizability and identify industry-specific implementation dynamics.

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