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The Impact of Enterprise Resource Planning (ERP) Software Implementation and System Quality on Service Quality at Oriskin Clinics (A Case Study of Three Oriskin Clinic Branches)

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Abstract

The digital transformation of healthcare service organizations requires integrated information systems capable of improving operational efficiency, data accuracy, and service quality. This study examined the effects of Enterprise Resource Planning (ERP) software implementation and system quality on service quality at three Oriskin Clinic branches located in Sentul, Karawang, and West Jakarta. An empirical quantitative design with an explanatory approach was employed. The study involved all 86 employees using the ERP system through a saturated sampling technique. Primary data were collected using a structured Likert-scale questionnaire and analyzed using validity and reliability tests, classical assumption testing, multiple linear regression, coefficient of determination, t-test, and F-test with IBM SPSS Statistics version 27. The results indicate that ERP software implementation has a positive and significant effect on service quality ($\beta = 0.535$, $p = 0.001$), while system quality also exerts a positive and significant effect ($\beta = 0.409$, $p = 0.001$). Simultaneously, both variables significantly influence service quality ($F = 1841.430$, $p = 0.001$) and explain 97.8% of its variance ($R^2 = 0.978$). These findings demonstrate that effective ERP implementation supported by high system quality substantially enhances operational performance and healthcare service quality in digitally integrated clinical environments.

Keywords: *Enterprise Resource Planning (ERP), Healthcare Service Quality, Multiple Linear Regression, System Quality, Web-Based Clinic.*

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INTRODUCTION

The accelerating pace of digital transformation has fundamentally reshaped organizational strategies, positioning integrated information systems as indispensable assets for sustaining operational excellence, organizational resilience, and competitive advantage across increasingly service-oriented industries. The transition of Enterprise Resource Planning (ERP) systems from manufacturing environments to healthcare organizations reflects a broader movement toward digitally connected, data-driven service ecosystems in which clinical, administrative, financial, and inventory processes are managed through a unified information architecture (Al-Assaf et al., 2025). The growing demand for patient-centered healthcare has simultaneously intensified expectations for faster, more accurate, and more transparent service delivery, encouraging healthcare providers to integrate digital platforms capable of minimizing operational fragmentation while improving decision-making quality (Firdaus et al., 2025). ERP implementation has consequently evolved beyond technological modernization into a strategic instrument for strengthening organizational responsiveness, enhancing interdepartmental coordination, and supporting sustainable healthcare management under increasingly dynamic business environments (Bialas et al., 2023). Such developments illustrate that the value of ERP is determined not merely by software deployment but by its capacity to become an integral component of organizational service processes. The transformation of healthcare information infrastructure therefore establishes a compelling context for investigating how ERP implementation contributes to service performance under real operational conditions.

Although ERP adoption has expanded considerably within healthcare organizations, empirical evidence consistently demonstrates that implementation success depends on considerably more than

technological installation because organizational outcomes are strongly conditioned by system quality, user interaction, and process integration. Previous studies have demonstrated that ERP implementation enhances healthcare service quality through improved resource coordination, integrated patient information management, and operational efficiency when organizational processes are adequately aligned with system capabilities (Fiaz et al., 2018). Recent investigations further indicate that successful ERP adoption is closely associated with critical organizational factors such as implementation governance, management commitment, user readiness, and system usability rather than software functionality alone (Reyes et al., 2025). Research on digital healthcare management has likewise emphasized that information system quality substantially influences users' perceptions of effectiveness, operational consistency, and service responsiveness because system stability directly affects everyday clinical workflows (Imam et al., 2024). Existing scholarship nevertheless presents ERP implementation as a multidimensional organizational phenomenon whose service outcomes emerge from the interaction between technological performance and operational execution rather than from isolated technological investment. This perspective suggests that evaluating ERP effectiveness requires simultaneous consideration of implementation practices and the quality characteristics of the information system supporting organizational activities.

Despite these advances, several conceptual and empirical inconsistencies remain unresolved within the contemporary ERP literature, particularly regarding service-based healthcare organizations operating under continuous patient interaction. Numerous studies primarily concentrate on ERP implementation success factors, organizational readiness, or digital transformation performance while treating service quality as a secondary organizational outcome rather than the principal performance indicator (Mukred et al., 2023). Other investigations have predominantly examined hospitals or large healthcare institutions, leaving beauty clinics and outpatient healthcare providers comparatively underrepresented despite their operational dependence on rapid transaction processing and intensive customer interaction (Nurshabrina et al., 2025). Research investigating system quality generally emphasizes user satisfaction or technology acceptance instead of examining how system quality directly strengthens service quality following ERP implementation (Syahfitri et al., 2023). The existing body of knowledge therefore provides only limited empirical understanding of how ERP implementation and system quality simultaneously influence service quality within web-based healthcare service environments characterized by high transaction intensity and direct patient engagement. This limitation becomes increasingly significant because operational contexts across healthcare organizations differ substantially in workflow complexity, service expectations, and digital maturity. A more integrated analytical perspective is therefore necessary to bridge fragmented findings across technological and service-performance research.

The practical significance of this issue becomes particularly evident in organizations that have recently introduced ERP systems and continue adapting operational practices to newly standardized digital workflows. Oriskin Clinics implemented ERP software approximately one year ago across three branches located in Sentul, Karawang, and West Jakarta, placing both the technological infrastructure and its users within a transitional adaptation period where operational disruptions remain highly possible. Internal operational records for December 2025 documented 88 data-entry errors from 528 sales transactions across the three branches, consisting primarily of incorrect customer names, payment-channel inaccuracies, and duplicate transaction entries that required repeated correction before service completion. Previous studies have shown that insufficient system quality, inadequate validation mechanisms, and poor alignment between information systems and organizational workflows frequently generate inefficiencies that ultimately affect service performance despite successful ERP deployment (Aroba et al., 2023). Evidence from healthcare organizations also indicates that technological change may unintentionally increase employee workload and technostress during the early implementation stage when system reliability and user adaptation remain suboptimal (Santoso et al., 2025). These operational conditions indicate that improving service quality requires understanding not only whether ERP has been implemented but also whether the quality of the implemented system adequately supports consistent and error-free service execution.

Current literature has not sufficiently examined the combined influence of ERP software implementation and system quality on service quality within web-based aesthetic healthcare clinics, even though this relationship represents an increasingly important issue for digitally intensive healthcare organizations. Existing studies generally evaluate ERP implementation from technological,

organizational, or operational perspectives independently, whereas integrated examinations connecting implementation quality, system quality, and perceived service quality remain relatively scarce in aesthetic healthcare settings (Bagaskara et al., 2024). The limited availability of empirical evidence becomes increasingly problematic because healthcare service quality is fundamentally determined by the consistency, reliability, and responsiveness of organizational processes that depend heavily on integrated information systems operating without interruption (Lende, 2025). Addressing this gap is expected to enrich the interdisciplinary discussion linking intelligent information systems with service engineering by demonstrating how technological quality translates into measurable organizational service outcomes. Such evidence is also expected to provide practical guidance for healthcare organizations seeking to refine standard operating procedures, strengthen internal control mechanisms, and reduce operational errors during post-implementation system adaptation.

This study is positioned to extend the current body of knowledge by simultaneously examining the effects of ERP software implementation and system quality on service quality within three branches of Oriskin Clinics that are experiencing the early stage of digital transformation. Unlike previous studies that predominantly investigate technological adoption or organizational readiness separately, this research integrates implementation effectiveness and system quality into a unified analytical framework to explain variations in healthcare service quality under actual operational conditions. Methodologically, the study employs a quantitative explanatory approach to evaluate both the partial and simultaneous effects of the proposed variables, providing a more comprehensive assessment of ERP performance within service-oriented healthcare organizations. The findings are expected to contribute theoretically by strengthening the understanding of the relationship between enterprise information systems and healthcare service quality while also providing empirical evidence from an organizational context that remains underrepresented in previous research. From a practical perspective, the study offers an evidence-based foundation for managerial decision-making regarding system optimization, employee capability development, operational standardization, and continuous digital service improvement within modern healthcare organizations.

RESEARCH METHODS

This study employed an empirical quantitative research design using an explanatory approach to examine the effects of Enterprise Resource Planning (ERP) software implementation and system quality on service quality at Oriskin Clinics. The empirical system architecture was based on a centralized web-based ERP platform implemented across three clinic branches—Sentul, Karawang, and West Jakarta—which integrates patient registration, appointment scheduling, inventory management, cashier transactions, and financial reporting into a unified database to support daily clinical operations (Al-Assaf et al., 2025). The study involved all 86 employees who actively used the ERP system, and because the population was relatively small and completely identifiable, a saturated sampling technique was employed. Primary data were collected using a structured questionnaire distributed through Google Forms following a pilot test involving 30 respondents to verify the validity and reliability of the measurement instrument. ERP software implementation was measured using five indicators comprising organized data transfer, measurable organizational objectives, business process reorganization, employee training, and workforce involvement, whereas system quality was measured through usability, ease of use, help facilities, reliability, flexibility, and learnability, while service quality was assessed using the SERVQUAL dimensions of reliability, responsiveness, assurance, empathy, and tangibles (Tjiptono & Chandra, 2011). The implementation stage included pilot testing, large-scale questionnaire administration, data coding, statistical screening, and dataset preparation prior to hypothesis testing to ensure consistent empirical measurement.

The instrument was first evaluated through Pearson Product Moment correlation analysis for validity and Cronbach's Alpha for reliability with a minimum acceptable coefficient of 0.60 before proceeding to inferential analysis (Ghozali, 2018). Classical assumption testing was subsequently conducted using the Kolmogorov–Smirnov normality test, multicollinearity analysis based on Tolerance and Variance Inflation Factor (VIF), and heteroscedasticity testing using scatterplot analysis to verify compliance with multiple regression assumptions. The relationships among the research variables were analyzed using the following multiple linear regression model:

$$Y = a + b_1X_1 + b_2X_2 + e$$

where Ydenotes service quality, X_1represents ERP software implementation, X_2represents system quality, $a$is the regression constant, $b_1$and $b_2$are the regression coefficients, and $e$denotes the random error term (Sugiyono, 2023). Partial hypotheses were evaluated using the t-test, simultaneous effects were examined using the F-test, and model performance was assessed through the coefficient of determination (R^2) to determine the proportion of variance in service quality explained by the independent variables. All statistical analyses were performed using IBM SPSS Statistics version 27 to ensure standardized parameter estimation, model validation, and reproducibility of the empirical findings.

RESULTS AND DISCUSSION

Respondent Profile and Measurement Model Assessment

The empirical analysis was conducted using data collected from 86 employees who actively operated the ERP system across the Sentul, Karawang, and West Jakarta branches of Oriskin Clinics. The respondent profile provides an important contextual foundation because perceptions regarding ERP implementation and system quality are closely associated with users' operational responsibilities, experience, and organizational environment. Healthcare organizations undergoing digital transformation often experience heterogeneous technology acceptance among employees occupying different functional roles, making respondent characteristics relevant for interpreting subsequent statistical findings (Reyes et al., 2025). The demographic composition in this study indicates that the collected responses adequately represent employees directly involved in daily ERP-supported business processes. Such representation strengthens the practical relevance of the empirical findings because the respondents regularly interact with integrated modules for patient administration, cashier operations, inventory control, and financial reporting. The distribution of respondent characteristics is presented in Table 1.

Table 1. Respondent Characteristics

Characteristic	Category	Frequency
Age	20–25 years	5
	25–30 years	36
	30–35 years	45
Position	Sales Manager	14
	Assistant Sales Manager	24
	Operational Manager	21
	Sales	27
Branch	Sentul	31
	Karawang	28
	West Jakarta	26

The data presented in Table 1 indicate that employees aged between 30 and 35 years constituted the largest proportion of respondents, followed by those aged 25–30 years, whereas respondents younger than 25 years represented only a small proportion of the sample. This composition reflects a workforce dominated by employees who are already familiar with standardized operational procedures and are capable of adapting to enterprise information systems within clinical environments. The largest occupational group consisted of sales personnel, followed by assistant sales managers and operational managers, indicating that ERP utilization extends beyond administrative functions and supports customer-facing activities throughout the service process. The relatively balanced distribution across the three clinic branches also reduces the likelihood that the findings are disproportionately influenced by a single operational location. Such respondent diversity provides a broader empirical perspective for evaluating the effectiveness of ERP implementation under comparable organizational settings.

Before testing the structural relationships among variables, the measurement instrument was evaluated through validity and reliability testing to ensure that each construct accurately represented its theoretical concept. The pilot study involving 30 respondents demonstrated that all questionnaire items

measuring ERP software implementation, system quality, and service quality achieved Pearson correlation coefficients exceeding the critical value at the 5% significance level, indicating satisfactory construct validity (Ghozali, 2018). These findings confirm that every indicator contributed meaningfully to the measurement of its respective latent construct and was therefore retained for the main survey. Instrument validity is particularly important in ERP-related research because inaccurate measurement may obscure the relationship between technological implementation and organizational performance. The validated instrument consequently provided an appropriate basis for collecting empirical data from the complete respondent population.

Table 2. Validity and Reliability Results

Variable	Number of Items	Cronbach's Alpha	Interpretation
ERP Software Implementation (X_1)	20	0.994	Reliable
System Quality (X_2)	24	0.995	Reliable
Service Quality (Y)	20	0.994	Reliable

As shown in Table 2, all research variables obtained Cronbach's Alpha coefficients substantially exceeding the recommended threshold of 0.60, demonstrating excellent internal consistency among the measurement items (Ghozali, 2018). Reliability values approaching one indicate that respondents answered the questionnaire consistently across indicators representing the same construct, thereby minimizing measurement error during subsequent statistical analysis. Although exceptionally high reliability coefficients may also suggest substantial similarity among certain questionnaire items, the observed values remain acceptable because each indicator reflects closely related operational dimensions within an integrated ERP environment. The consistency of the measurement instrument strengthens confidence that variations in respondents' perceptions are primarily associated with actual differences in ERP implementation, system quality, and service quality rather than inconsistencies within the instrument itself. These results establish a robust empirical foundation for inferential analysis using multiple linear regression.

The satisfactory validity and reliability outcomes demonstrate that the research instrument possesses adequate psychometric quality for evaluating organizational perceptions of ERP implementation in healthcare services. Integrated information systems require measurement instruments capable of capturing both technological and operational dimensions because users simultaneously evaluate software functionality, system performance, and service outcomes during routine activities (Ismail et al., 2024). The strong measurement performance observed in this study is consistent with previous ERP research reporting that reliable instruments are essential for producing stable estimates of relationships among implementation quality, information systems, and organizational performance (Syahfitri et al., 2023). The quality of the measurement model therefore supports the credibility of the subsequent regression analysis by ensuring that the investigated constructs adequately represent employees' actual experiences with the ERP platform. This measurement assessment also reduces the likelihood that the statistical relationships identified in later analyses originate from instrument deficiencies rather than substantive organizational phenomena.

The respondent profile and measurement model collectively indicate that the dataset is appropriate for examining the effects of ERP software implementation and system quality on service quality within Oriskin Clinics. The demographic distribution reflects the operational characteristics of ERP users across different organizational functions, while the measurement evaluation confirms that the collected data satisfy fundamental psychometric requirements for empirical hypothesis testing. The combination of representative respondents and highly reliable measurement instruments increases the robustness of the analytical model developed in this study. The subsequent analysis therefore focuses on evaluating whether the statistical assumptions required for multiple linear regression are satisfied before interpreting the causal relationships among the proposed variables.

Classical Assumption Testing and Regression Model Performance

Prior to hypothesis testing, the proposed regression model was evaluated through a series of classical assumption tests to ensure that the empirical data satisfied the statistical requirements for multiple linear regression analysis. These diagnostic procedures are essential because violations of

regression assumptions may reduce the precision and interpretability of estimated coefficients, particularly in studies involving closely related organizational variables (Ghozali, 2018). The present study assessed data normality using the Kolmogorov–Smirnov test, heteroscedasticity through scatterplot analysis, and multicollinearity using the Tolerance and Variance Inflation Factor (VIF) indicators. Each diagnostic test was performed using IBM SPSS Statistics version 27 before estimating the structural relationship among the research variables. The overall results indicate that the regression model satisfied most statistical assumptions required for inferential analysis despite the presence of substantial multicollinearity between the independent variables. The interpretation of each diagnostic procedure is presented sequentially in the following discussion.

The Kolmogorov–Smirnov test produced a significance value of 0.200, exceeding the threshold value of 0.05 and indicating that the regression residuals followed a normal distribution. Visual examination of the histogram and Normal Probability Plot further confirmed this result because the residual distribution approximated a normal curve and the plotted observations closely followed the diagonal reference line. These findings indicate that the regression residuals did not exhibit meaningful deviation from normality, thereby supporting the validity of subsequent significance testing. A normally distributed residual structure contributes to more reliable estimation of regression parameters and reduces the possibility of biased statistical inference in quantitative organizational research (Sugiyono, 2023). Similar statistical characteristics have been reported in previous ERP implementation studies that successfully modeled organizational outcomes using parametric regression techniques (Mukred et al., 2023). The graphical diagnostics supporting the normality assessment are presented in Figure 1.

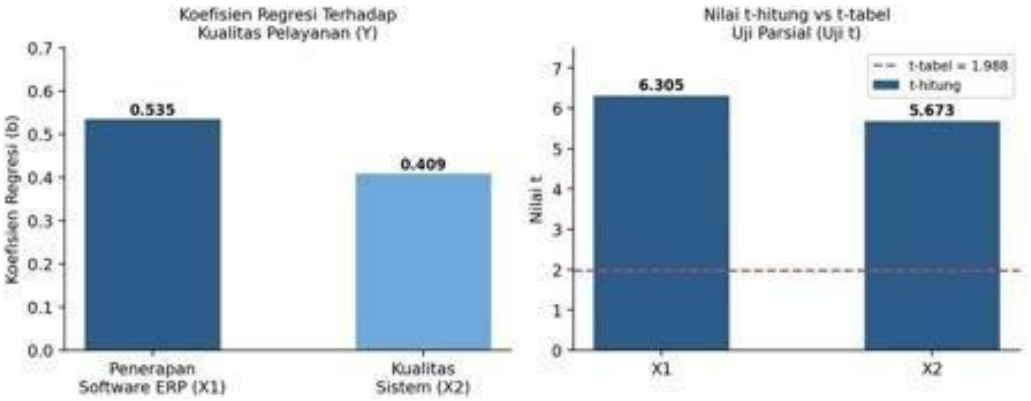


Figure 1. Regression Diagnostic Graphs and t-Statistics for Independent Variables

The heteroscedasticity test demonstrated that the residuals were randomly distributed above and below the horizontal axis without forming any systematic pattern within the scatterplot. Such a distribution indicates that the variance of the residuals remained relatively constant across predicted values, satisfying the homoscedasticity assumption required for regression analysis. Stable residual variance suggests that prediction errors were not influenced by differences in ERP implementation or system quality scores across respondents. This finding strengthens the reliability of the estimated regression coefficients because unequal error variance has the potential to distort statistical significance and confidence intervals (Ismail et al., 2024). In contrast, the multicollinearity analysis revealed a Tolerance value of 0.039 and a VIF value of 25.920 for both independent variables, indicating a strong linear relationship between ERP software implementation and system quality. Such a result is understandable because respondents evaluated two closely related dimensions of the same integrated ERP platform that had recently been implemented across the three clinic branches (AlMarri et al., 2025). Following confirmation that the regression model remained appropriate for hypothesis testing, multiple linear regression analysis was performed to estimate the contribution of each independent variable to service quality. The estimated regression equation was expressed as:

$$Y = -1.524 + 0.535X_1 + 0.409X_2$$

where Ydenotes service quality, X_1represents ERP software implementation, and X_2represents system quality. The regression coefficients indicate that both independent variables exerted positive

effects on service quality, with ERP software implementation demonstrating a slightly greater contribution than system quality. Positive coefficient values indicate that improvements in implementation practices and system performance are associated with corresponding improvements in perceived service quality. The detailed regression coefficients and partial hypothesis testing results are summarized in Table 3.

Table 3. Multiple Linear Regression and Partial Hypothesis Testing

Variable	B	t-value	Sig.	Decision
Constant	-1.524	–	–	–
ERP Software Implementation (X_1)	0.535	6.305	0.001	Supported
System Quality (X_2)	0.409	5.673	0.001	Supported

The results presented in Table 3 demonstrate that ERP software implementation and system quality each produced positive regression coefficients and statistically significant *t*-values, confirming that both variables individually contribute to improvements in service quality. The stronger regression coefficient observed for ERP software implementation suggests that organizational integration, employee involvement, and standardized digital workflows contribute slightly more to service quality than technical system characteristics alone. Similar findings have been reported in healthcare ERP research demonstrating that successful implementation strategies substantially improve operational efficiency and patient-oriented service delivery (Aroba et al., 2023). These empirical results also indicate that technological investment alone is insufficient without effective organizational implementation capable of translating system capabilities into operational improvements. The consistency between the regression coefficients and significance values strengthens confidence in the proposed research model. The overall performance of the regression model is subsequently evaluated through simultaneous hypothesis testing and the coefficient of determination.

Table 4. Simultaneous Hypothesis Testing and Model Performance

Indicator	Value
F-value	1841.430
F Significance	0.001
R^2	0.978
Adjusted R^2	0.977

Table 4 indicates that the regression model achieved an F-value of 1841.430 with a significance level of 0.001, confirming that ERP software implementation and system quality jointly exert a statistically significant influence on service quality. The coefficient of determination of 0.978 indicates that 97.8% of the variation in service quality can be explained by the two independent variables included in the regression model, while only 2.2% is attributable to external factors not examined in this study. This exceptionally high explanatory power reflects the strategic role of integrated digital systems in supporting operational performance within healthcare service organizations. Comparable evidence has been reported in studies demonstrating that ERP-supported healthcare processes substantially improve organizational effectiveness through synchronized information flow and standardized operational activities (Bialas et al., 2023). The presence of strong multicollinearity should nevertheless be considered when interpreting the relative magnitude of individual regression coefficients because both predictors represent closely related dimensions of the same technological environment. These findings provide a robust statistical foundation for examining the individual and combined effects of ERP software implementation and system quality on service quality in the subsequent discussion section.

Effect of ERP Software Implementation and System Quality on Service Quality

The regression analysis demonstrated that both ERP software implementation and system quality exerted positive and statistically significant effects on service quality at Oriskin Clinics. These findings indicate that improvements in digital process integration and technical system performance contribute directly to employees' perceptions of better healthcare service delivery. The statistical evidence confirms that organizational digital transformation extends beyond technological adoption

because operational benefits are realized only when users experience efficient and reliable system performance during routine activities. This outcome reflects the practical value of integrating patient management, cashier transactions, inventory control, and financial reporting into a centralized ERP environment capable of supporting daily clinical operations. The observed relationships also indicate that service quality in healthcare organizations is increasingly shaped by the effectiveness of digital infrastructures supporting operational workflows. The empirical interpretation of the statistical findings is summarized in Table 5.

Table 5. Interpretation of Empirical Findings

Variable	Statistical Result	Practical Interpretation
ERP Software Implementation	Positive and significant	Integrated business processes improve operational coordination, accelerate service execution, and reduce administrative errors.
System Quality	Positive and significant	Reliable, user-friendly, and flexible systems improve transaction accuracy, accessibility of information, and service responsiveness.
Simultaneous Effect	Significant	ERP implementation and system quality jointly strengthen operational efficiency and overall healthcare service quality.

The positive influence of ERP software implementation indicates that successful digital transformation depends not only on software deployment but also on the effectiveness of organizational implementation practices. The regression coefficient of 0.535 suggests that improvements in ERP implementation are associated with meaningful increases in perceived service quality among employees. Integrated operational processes enable staff to access patient records, inventory information, and financial transactions through a unified platform, reducing duplication of work and improving coordination across departments. Such organizational integration contributes to faster response times and more consistent service delivery during patient interactions. Similar findings have been reported by Fiaz et al. (2018), who concluded that ERP implementation enhances healthcare service quality by improving information integration and operational efficiency. Al-Assaf et al. (2025) likewise emphasized that ERP implementation creates organizational value when digital processes become fully embedded within routine healthcare operations.

System quality also demonstrated a statistically significant contribution to service quality, indicating that technical characteristics remain fundamental to the success of healthcare information systems. Employees perceived reliable system performance, intuitive interfaces, and rapid information retrieval as important factors supporting accurate and efficient clinical services. A regression coefficient of 0.409 indicates that improvements in system quality produce measurable gains in service performance, although the contribution is slightly lower than that of ERP implementation. Reliable system functionality reduces processing delays and minimizes the likelihood of operational errors during patient registration, payment processing, and inventory management. Imam et al. (2024) similarly reported that high-quality healthcare information systems improve service effectiveness by enhancing operational reliability and information accessibility. Consistent with these findings, Syahfitri et al. (2023) argued that system quality represents one of the principal determinants of successful enterprise information systems because users depend on stable technological performance throughout organizational activities.

The simultaneous significance of ERP software implementation and system quality indicates that healthcare service quality is determined by the interaction between organizational capability and technological capability rather than by either dimension independently. ERP implementation establishes standardized digital workflows, whereas system quality ensures that these workflows operate efficiently and consistently during routine service delivery. This complementary relationship explains the exceptionally high coefficient of determination obtained in the regression model, suggesting that the proposed variables collectively capture most of the variation in perceived service quality. Similar conclusions were reported by Bagaskara et al. (2024), who found that healthcare digitalization requires integrated enterprise systems supported by dependable technological

infrastructure to produce sustainable organizational improvements. Bialas et al. (2023) likewise demonstrated that ERP integration enhances organizational performance by synchronizing operational activities across multiple functional units. These findings indicate that technological investment generates maximum organizational benefit only when implementation quality and system quality evolve in a mutually reinforcing manner.

The present findings contribute to the development of intelligent healthcare information systems by demonstrating that organizational implementation and technical system performance should be evaluated as complementary dimensions of ERP success. Previous studies frequently examined ERP adoption, implementation success, or system quality independently, whereas the current study demonstrates that their combined influence explains a substantial proportion of healthcare service quality within an integrated clinical environment. This integrated perspective supports the ongoing transition toward digitally connected healthcare services where operational efficiency depends on continuous interaction between organizational processes and intelligent information technologies. Firdaus et al. (2025) emphasized that sustainable healthcare digitalization requires coordinated development of technological infrastructure, organizational readiness, and service-oriented operational processes to maximize institutional performance. The empirical evidence obtained from the three Oriskin Clinic branches reinforces this perspective by illustrating that intelligent ERP implementation extends beyond administrative automation and functions as a strategic mechanism for improving healthcare service quality. Future studies may expand this analytical framework by incorporating organizational culture, digital competence, user satisfaction, or technostress to provide a more comprehensive explanation of ERP performance in healthcare organizations.

Engineering Implications and Research Contribution

The empirical findings demonstrate that ERP implementation should be interpreted not merely as the deployment of enterprise software but as an engineering solution that restructures operational workflows within healthcare service organizations. The significant effects of ERP software implementation and system quality indicate that organizational performance improves when technological architecture is effectively aligned with clinical and administrative processes. The centralized ERP platform implemented across the three Oriskin Clinic branches integrates patient registration, inventory management, cashier transactions, and financial reporting into a unified operational environment that supports consistent service delivery. Such integration reduces fragmented information processing and minimizes repetitive administrative activities that commonly occur in conventional manual systems. From an intelligent engineering perspective, the value of ERP lies in its ability to synchronize information flow across organizational functions while maintaining data consistency during daily operations. These findings suggest that digital integration constitutes an important engineering mechanism for improving operational reliability in healthcare organizations.

The engineering significance of the proposed ERP implementation also lies in its capability to transform isolated operational activities into interconnected digital processes that facilitate faster coordination and more accurate decision-making. Employees no longer rely on separate spreadsheets or manual verification because operational information is processed through a centralized database that is simultaneously accessible by different organizational units. This integrated architecture supports real-time communication among clinical, administrative, and financial functions while reducing the possibility of duplicated data entry and transaction inconsistencies. Similar observations have been reported by Shohet and Nobili (2016), who emphasized that ERP platforms improve clinic operational performance through integrated process management and centralized information control. Hanum et al. (2020) likewise argued that ERP implementation enhances organizational efficiency by standardizing business processes and improving coordination among operational divisions. The practical engineering implications derived from the present findings are summarized in Table 6.

Table 6. Engineering Implications of ERP Implementation at Oriskin Clinics

Operational Aspect	Before ERP Implementation	After ERP Implementation	Engineering Implication

Patient Information Management	Manual verification and separate records	Centralized patient database	Faster retrieval of patient information and reduced duplication of records
Payment Transaction	Manual payment confirmation	Integrated cashier module	Improved transaction accuracy and reduced input errors
Inventory Management	Independent inventory recording	Real-time inventory synchronization	Better stock visibility and inventory control
Operational Workflow	Fragmented administrative process	Integrated cross-functional workflow	Higher operational efficiency and improved interdepartmental coordination
Managerial Reporting	Delayed report preparation	Real-time reporting dashboard	Faster managerial decision-making and continuous operational monitoring

The engineering improvements presented in Table 6 illustrate that ERP implementation generates operational benefits through process integration rather than through isolated task automation. The centralized database architecture enables synchronized access to operational information, allowing employees from different functional areas to perform their responsibilities using the same real-time dataset. This configuration minimizes administrative redundancy while improving transaction accuracy, inventory visibility, and reporting consistency across clinic branches. The availability of real-time managerial dashboards also enables supervisors to monitor operational performance more efficiently and respond rapidly to emerging service issues before they affect patients. These characteristics represent essential attributes of intelligent information systems because they support adaptive organizational decision-making based on continuously updated operational data. The findings therefore demonstrate that engineering-oriented ERP implementation strengthens both operational efficiency and service reliability within healthcare organizations.

The contribution of this study extends beyond statistical verification by providing empirical evidence regarding ERP implementation within aesthetic healthcare clinics, a setting that has received considerably less attention than hospitals or large medical institutions. Unlike hospital environments, aesthetic clinics operate with intensive customer interaction, shorter service cycles, and frequent transactional activities that require highly responsive information systems. The findings indicate that ERP implementation remains capable of improving organizational performance under these operational characteristics when supported by adequate system quality and effective implementation strategies. Suratmanto and Rahardjo Emanuel (2024) emphasized that ERP effectiveness depends on the compatibility between technological architecture and organizational operational requirements rather than on software functionality alone. The present study therefore broadens the empirical application of ERP research by demonstrating its relevance in customer-oriented healthcare organizations operating within digitally integrated environments. This evidence contributes to the expanding literature on intelligent healthcare engineering and digital service management.

From a theoretical perspective, the study reinforces the proposition that ERP software implementation and system quality should be conceptualized as complementary organizational capabilities that jointly influence service quality. The exceptionally high explanatory power of the regression model indicates that organizational implementation practices and technical system performance interact to produce substantial improvements in healthcare service delivery. This integrated perspective enriches current discussions on digital transformation by emphasizing that technological investment generates sustainable organizational value only when accompanied by effective operational implementation. Gartner (2024) reported that enterprise software initiatives achieve long-term organizational benefits when technology deployment is synchronized with process redesign and organizational readiness. The findings of the present study provide empirical support for this perspective within the context of healthcare service organizations using centralized ERP platforms. The study therefore contributes both practical and theoretical evidence supporting intelligent ERP implementation as a strategic mechanism for improving healthcare service quality.

Several limitations should nevertheless be considered when interpreting the findings of this study. The investigation involved employees from only three branches of a single healthcare organization, limiting the broader generalization of the results to organizations with different operational characteristics or levels of technological maturity. The presence of substantial multicollinearity between ERP software implementation and system quality also suggests that future studies should employ more advanced analytical approaches, such as Structural Equation Modeling or Partial Least Squares, to examine more complex causal relationships. Additional organizational variables, including digital competence, user satisfaction, organizational culture, and technostress, may further explain variations in ERP implementation outcomes across healthcare institutions. Santoso et al. (2025) demonstrated that employees' psychological adaptation to newly implemented ERP systems significantly influences organizational performance, indicating the importance of incorporating behavioral factors into future research models. Expanding the analytical framework in this direction would provide a more comprehensive understanding of intelligent ERP implementation and its long-term contribution to healthcare service quality.

CONCLUSION

This study confirms that both Enterprise Resource Planning (ERP) software implementation and system quality are significant determinants of service quality in the operational context of Oriskin Clinics. The regression analysis demonstrates that ERP software implementation has a positive and significant effect on service quality, as indicated by a regression coefficient of 0.535 and a t-value of 6.305 ($p = 0.001$). System quality also exerts a positive and significant influence on service quality, with a regression coefficient of 0.409 and a t-value of 5.673 ($p = 0.001$). Simultaneously, both independent variables significantly explain variations in service quality, as reflected by an F-value of 1841.430 ($p = 0.001$). The coefficient of determination ($R^2 = 0.978$) indicates that 97.8% of the variance in service quality can be explained by ERP software implementation and system quality, while the remaining 2.2% is attributable to factors outside the proposed research model. These findings demonstrate that effective ERP implementation supported by a reliable, user-friendly, and integrated system architecture substantially improves operational coordination, transaction accuracy, information accessibility, and overall healthcare service delivery. The study also contributes to the intelligent engineering and healthcare information systems literature by providing empirical evidence that organizational implementation quality and technical system performance should be viewed as complementary capabilities in achieving superior service quality.

From a practical perspective, healthcare organizations should continuously evaluate ERP implementation strategies, strengthen system quality through routine maintenance and enhancement of data validation features, and provide regular user training to maximize the operational benefits of digital transformation initiatives. Continuous improvement of ERP-supported workflows is expected to reduce administrative errors, improve interdepartmental coordination, and support faster managerial decision-making through real-time information availability. The findings further suggest that successful digital transformation requires organizational readiness and employee engagement in addition to technological investment. Despite the strong explanatory power of the proposed model, the presence of substantial multicollinearity between ERP software implementation and system quality indicates that the two constructs represent highly interconnected dimensions within the same digital ecosystem. Future studies are encouraged to employ more advanced analytical approaches, such as Structural Equation Modeling (SEM) or Partial Least Squares Structural Equation Modeling (PLS-SEM), to investigate more complex causal relationships among technological and organizational factors. Incorporating additional variables, including information quality, user satisfaction, digital competence, organizational culture, technostress, and top management support, may further improve the explanatory capability of future research models. Expanding the investigation to hospitals, specialized clinics, and other healthcare institutions with broader organizational characteristics and larger sample sizes would also enhance the generalizability and practical applicability of the findings.

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