

Implementation of a Web-Based Financial Information System to Improve Efficiency at PT Tri Yulida Sultra

Mahdi Ramadhan Mulyono¹, Syamsu Alam², Valentino Aris³

Digital Business Department, Faculty of Economics and Business, Universitas Negeri Makassar, Indonesia^{1,2,3}

Corresponding Author: Syamsu Alam (alam.s@unm.ac.id)

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ABSTRACT

Digital transformation has increased the need for integrated financial information systems that can improve operational efficiency and information accessibility. PT Tri Yulida Sultra, a catering and laundry service company, previously managed financial activities using handwritten records, Microsoft Excel, and WhatsApp, resulting in fragmented data, repetitive administrative work, and reporting delays. This study aimed to develop and evaluate a web-based Financial Information System that integrates transaction recording, daily QTY management, recapitulation, reporting, invoice generation, dashboard monitoring, and role-based access. The study employed a Research and Development approach using the Waterfall model, with data collected through observation, interviews, and documentation. System performance was evaluated using Black Box Testing, Time Study, Motion Study, and Cost-Benefit Analysis. The results showed that all predefined functional scenarios were completed, processing efficiency improved substantially, non-value-added activities were reduced, and the system achieved a Benefit-Cost Ratio of 3.98. These findings indicate that the developed system is functionally valid, operationally efficient, and economically feasible within the evaluated business processes.

Keywords: Financial Information System; Operational Efficiency; Time Study; Motion Study; Cost-Benefit Analysis



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INTRODUCTION

The rapid development of information technology has accelerated digital transformation across organisational settings, particularly through the adoption of integrated digital systems to improve operational efficiency, information accessibility, and managerial decision-making (Brennen & Kreiss, 2016; Verhoef et al., 2021). These developments have encouraged organisations to replace fragmented, conventional work procedures with technology-supported processes that enable more systematic information management. Westerman et al. (2014) emphasised that digital transformation is increasingly associated with organisational efforts to improve productivity, competitiveness, and long-term business performance. In this context, digitalisation is not limited to converting manual records into electronic formats but also involves redesigning processes to enable information to move more efficiently across organisational functions. Consequently, the ability to integrate information processing has become an important requirement for organisations

managing increasingly complex operational activities. Information systems support organisational activities by facilitating the collection, processing, storage, and distribution of information required for managerial purposes (Davis & Olson, 1985). Subsequent studies have also shown that information technology can improve organisational performance by supporting more efficient and reliable business processes (Stolterman & Fors, 2004; Salman et al., 2026; Asizah et al., 2026). Within financial management, these capabilities are particularly relevant because transaction recording, reporting, monitoring, and managerial control depend on timely and consistent information. An integrated financial information environment can therefore reduce the limitations associated with fragmented data processing while improving the availability of information for operational and managerial decisions. Previous studies have reported positive outcomes from implementing web-based financial information systems for financial administration and transaction management (Christian et al., 2022; Rahmatika & Martyas Edi, 2022; Isma et al., 2024). Christian et al. (2022) found that a web-based financial recording system improved the effectiveness of financial transaction management, while Rahmatika and Martyas Edi (2022) reported improvements in financial administration and report preparation. Isma et al. (2024) further demonstrated that integrated data processing and improved information accessibility contributed to better financial management performance. Collectively, these findings indicate that the benefits of financial information systems are associated not only with electronic recordkeeping but also with the integration and automation of activities that were previously performed separately. Such integration may become increasingly important in organisations where financial processes involve multiple operational units and repeated administrative procedures.

Studies conducted in service-oriented businesses have similarly demonstrated the usefulness of web-based systems for supporting catering and laundry operations. Wibowo et al. (2022) reported that a web-based cash management system improved financial recording and data organisation in a catering business, while Haryadi et al. (2025) developed a web-based catering information system to support operational management and information accessibility. In the laundry sector, Mardi et al. (2020) and Wijanarko (2021) showed that web-based systems could improve transaction management, financial administration, and reporting processes. However, these studies generally examined catering and laundry operations separately, leaving limited evidence regarding the use of a single financial information system to integrate financial processes across different service activities within the same organisation. Company records at PT Tri Yulida Sultra show that the organisation managed revenue exceeding IDR 6.7 billion between May and July 2025 across its catering and laundry operations. This transaction volume created a substantial administrative requirement because financial and operational information had to be recorded, consolidated, verified, and reported across different business activities. The company therefore required a financial management mechanism capable of providing accurate, integrated, and timely information for operational control and managerial decision-making. The need was particularly relevant because the catering and laundry units generated distinct operational records yet ultimately contributed to the same organisational financial management process. Under such conditions, fragmented information management may increase the administrative burden of consolidating and monitoring financial activities.

Observations and interviews conducted at PT Tri Yulida Sultra indicated that financial management activities continued to rely on Microsoft Excel, handwritten records, and WhatsApp-based communication. The use of separate recording and communication channels required that transaction data from different operational units be consolidated manually before management submission. This process resulted in fragmented financial information, repetitive administrative work, prolonged reporting procedures, and greater exposure to recording errors. Similar difficulties have been reported in studies of organisations that rely on conventional financial administration, where manual processing and fragmented data management contribute to inefficiencies in transaction recording and reporting (Mardi et al., 2020; Christian et al., 2022). The studies reviewed in this research indicate that existing work has largely concentrated on system development, financial recording, and functional implementation in individual organisational or service contexts (Rahmatika & Martyas Edi, 2022; Waziana & Saputra, 2023;

Grados-Espinoza & Velasquez-Jimenez, 2025). Although these studies demonstrate the practical usefulness of web-based financial systems, they provide less explanation of how process integration and automation translate into measurable reductions in processing time and non-value-added activities. Evidence is also limited on whether these operational improvements generate economic benefits sufficient to justify the resources invested in system implementation. This leaves an unresolved methodological issue concerning how a financial information system should be evaluated beyond functional correctness alone. A more comprehensive evaluation is therefore required to integrate system functionality, workflow improvements, operational efficiency, and economic feasibility into a single analytical framework. This study addresses that gap by implementing an integrated web-based Financial Information System for the catering and laundry operations of PT Tri Yulida Sultra and evaluating its performance through complementary functional, operational, and economic measures. The system integrates transaction management, daily quantity monitoring, financial recapitulation, invoice generation, reporting, dashboard visualisation, and role-based access control within a centralised platform. Its evaluation combines Black Box Testing to assess functional validity, Time Study to measure changes in processing time, Motion Study to identify reductions in unnecessary work activities, and Cost-Benefit Analysis to assess the economic value of the resulting operational improvements (Niebel & Freivalds, 2003; Pannell et al., 2024). The methodological contribution of this research, therefore, lies in linking system implementation to measurable changes in workflow efficiency and economic outcomes, rather than evaluating software functionality in isolation. Accordingly, the study aims to determine whether integrating and automating financial processes can improve financial management efficiency, reduce manual administrative activities, accelerate reporting, and support more integrated financial monitoring within the specific operational context of PT Tri Yulida Sultra.

THEORETICAL FRAMEWORK

Financial Information Systems and Digital Financial Management

Financial Information Systems provide an organisational mechanism for collecting, processing, storing, and communicating financial information through an integrated information environment. Davis and Olson (1985) explained that information systems support managerial activities by transforming organisational data into information for operational control and decision-making. More recent research has extended this perspective by showing that digital transformation allows organisations to reorganise information flows, integrate previously separated activities, and improve the efficiency of business processes (Verhoef et al., 2021; Plekhanov et al., 2023). In financial management, Christian et al. (2022), Rahmatika and Martyas Edi (2022), and Isma et al. (2024) found that web-based financial systems improved transaction management, reporting processes, and access to financial information. These findings indicate that the contribution of a Financial Information System extends beyond electronic recordkeeping, as its effectiveness also depends on how effectively the system integrates financial activities and information flows. The effectiveness of an information system should therefore be considered in relation to the quality of the processes and organisational activities that it supports. Al-Okaily (2024) found that information quality, process quality, and service quality were associated with individual and workgroup performance, which subsequently contributed to organisational performance. In financial applications, integrated data processing can reduce dependence on separate recording channels and provide users with more consistent access to information required for financial administration (Isma et al., 2024). Accordingly, the implementation of a Financial Information System can be viewed as an intervention that reorganises how financial information is processed rather than merely replacing paper- or spreadsheet-based records with a digital interface.

Process Integration and Automation

Process integration and automation represent important mechanisms through which digital systems can influence operational performance. Plekhanov et al. (2023) identified process transformation as an important dimension of digital transformation because digital technologies enable

organisations to restructure existing activities and improve operational efficiency. Research on process automation provides further evidence that repetitive, rule-based activities are particularly well-suited to automation, enabling organisations to reduce manual intervention and redirect effort toward activities requiring greater professional judgment (Eulerich et al., 2022). Perdana et al. (2023) similarly found that automation in accounting-related processes can improve the efficiency and accuracy of repetitive procedures, although successful implementation also depends on organisational and technological conditions. These findings suggest that efficiency improvements arise not simply from the presence of technology but from changes in the structure and execution of the underlying business processes. In financial management, integration and automation may therefore reduce repeated data transfer, manual calculations, document preparation, and communication activities that do not directly contribute to the completion of the core financial process. The relevance of process integration is particularly evident when financial information originates from multiple operational activities.

Wibowo et al. (2022) showed that web-based financial recording supported better organisation of financial data in catering operations, while Mardi et al. (2020) and Wijanarko (2021) reported improvements in transaction and administrative processes within laundry services. These studies demonstrate the practical value of information systems within individual service settings but provide limited evidence concerning the integration of different service operations into a common financial workflow. Integrating such processes into a centralised platform may reduce fragmentation by enabling operational data, transaction records, invoice preparation, and financial reporting to be managed within a connected information environment.

Processing Time, Work Activities, and Operational Efficiency

Changes can examine operational efficiency in both the time required to complete a process and the activities performed within it. Niebel and Freivalds (2003) established that work measurement and motion analysis can be used to identify inefficient work elements and redesign procedures to reduce unnecessary effort. More recent research on digital process automation supports this principle by demonstrating that automation can reduce the time required for repetitive procedures and limit manual intervention in structured tasks (Eulerich et al., 2022; Perdana et al., 2023). Within a Financial Information System, these improvements may occur when calculations, recapitulation, document generation, and information transfer that were previously performed separately become integrated or automated. The resulting efficiency should therefore be reflected not only in shorter completion times but also in changes to the composition of activities required to complete a financial process. Time Study provides a quantitative basis for examining whether system implementation reduces the processing time required for comparable financial activities. Previous studies of web-based financial systems have reported improvements in administrative and reporting efficiency following the integration of financial data and processes (Rahmatika & Martyas Edi, 2022; Waziana & Saputra, 2023). Motion Study provides a complementary perspective because it focuses on the sequence and necessity of work activities rather than elapsed time alone (Niebel & Freivalds, 2003). The combination of these approaches allows operational improvement to be interpreted as both a reduction in processing duration and a reduction in non-value-added activities within the workflow.

Non-value-added activities are particularly relevant when manual financial processes involve repeated recording, data transfer, document formatting, verification, or communication that does not directly change the financial information being produced. Research on automated accounting processes indicates that repetitive, structured tasks are among the activities most suitable for digital automation, as their execution can be standardised and transitioned from manual to system-supported procedures (Eulerich et al., 2022; Perdana et al., 2023). Reducing these activities does not necessarily mean that every user interaction or work motion will disappear after the system is implemented. Some essential activities, such as entering source transaction data and confirming financial information, may remain necessary even in an integrated system. Operational improvement may instead be reflected in a shift from repetitive or non-value-added work to activities necessary to complete and control the financial process. This distinction provides a

theoretical basis for evaluating changes in both total motions and non-value-added motions before and after system implementation.

Information System Effectiveness and Operational Outcomes

Information system effectiveness is a multidimensional concept and should not be inferred solely from the successful execution of software functions. Al-Okaily (2024) demonstrated that system effectiveness is associated with several dimensions, including information quality, process quality, individual performance, workgroup performance, and organisational performance. Functional testing can establish whether system features operate according to predefined requirements, but it does not independently demonstrate improvements in workflow efficiency or broader organisational performance. Time Study and Motion Study address a different level of evaluation by examining how system implementation changes the time and work activities required to perform operational processes. Accordingly, functional validity and operational efficiency should be interpreted as related but distinct outcomes. In contrast, claims about broader organisational effectiveness require additional evidence regarding users, organisational performance, and longer-term system use.

This distinction provides an important basis for the evaluation framework applied in the present study. Black Box Testing assesses technical and functional performance by determining whether the developed functions produce the expected outputs. Time Study evaluates changes in processing duration, whereas Motion Study examines changes in work activities and the occurrence of non-value-added procedures. These measures allow the operational consequences of system implementation to be evaluated without assuming that functional success alone represents overall organisational effectiveness.

Economic Benefits and Cost-Benefit Analysis

Improvements in processing efficiency become economically relevant when reductions in time and administrative effort translate into measurable benefits relative to the resources invested in system implementation. Pannell et al. (2024) explained that Cost-Benefit Analysis provides a structured basis for comparing the benefits generated by an intervention with the costs required to implement it, with a Benefit-Cost Ratio greater than one indicating that benefits exceed costs under the assumptions applied in the analysis. In the context of financial process digitalisation, reductions in processing time and unnecessary work can create economic value through lower labour requirements and more efficient utilisation of operational resources. Cost-Benefit Analysis therefore extends the evaluation beyond technical and process performance by examining whether the measured operational improvements are sufficient to justify the financial resources allocated to system development and implementation. The relationship between operational and economic outcomes is important because a technically functional system does not necessarily generate an economically meaningful improvement. Grados-Espinoza and Velasquez-Jimenez (2025) reported that digital financial management can improve resource utilisation and financial efficiency, while research on process automation has similarly associated reductions in repetitive work with improved resource efficiency (Perdana et al., 2023). Economic evaluation should therefore be based on identifiable operational changes rather than on the assumption that digitalisation automatically creates financial benefits. In this study, the economic dimension is consequently positioned as the final stage of evaluation, following the measurement of functional performance and operational efficiency.

Conceptual Framework

The conceptual framework of this study posits that implementing a Financial Information System improves operational efficiency through process integration and automation. Previous studies indicate that integrated digital systems can reorganise information flows and reduce dependence on fragmented and repetitive administrative procedures (Verhoef et al., 2021; Plekhanov et al., 2023). Process automation may reduce manual intervention, processing time, and unnecessary work activities, particularly in repetitive, structured procedures (Eulerich et al., 2022; Perdana et al., 2023). Reductions in processing time and non-value-added activities represent measurable

operational outcomes that can improve the utilisation of organisational resources. When these operational improvements can be quantified in monetary terms, their economic significance can be assessed through Cost-Benefit Analysis.

Based on this relationship, the evaluation framework follows a sequential logic from system implementation to economic outcomes. Black Box Testing first determines whether the implemented system performs its intended functions. At the same time, Time Study measures changes in processing duration associated with the transition from manual to system-supported processes. Motion Study then examines whether the same implementation changes the structure of work by eliminating unnecessary, non-value-added activities. Cost-Benefit Analysis translates the measurable operational improvements into an economic assessment by comparing the resulting benefits with implementation costs. The combined framework therefore connects functional performance, process transformation, operational efficiency, and economic feasibility rather than treating the four evaluation methods as independent assessments. This framework provides the conceptual basis for evaluating the Financial Information System implemented at PT Tri Yulida Sultra.

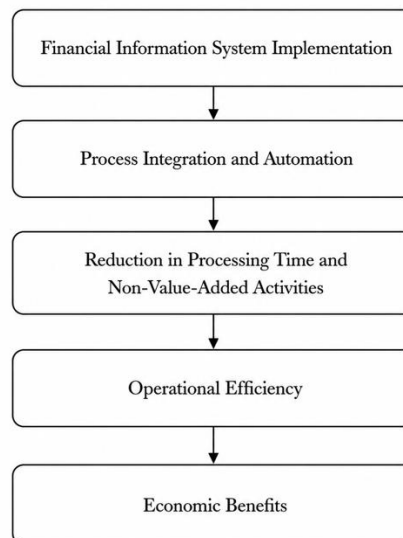


Figure 1. Conceptual Framework

METHODS

This study employed a Research and Development (R&D) approach to develop and evaluate a web-based Financial Information System for PT Tri Yulida Sultra in Kolaka, Southeast Sulawesi. The research was conducted from October to December 2025 and followed the Waterfall model comprising requirements analysis, system design, coding, testing, and maintenance. A comparable structured development approach was applied by Abinsair et al. (2025), who employed R&D and the Waterfall model, with needs analysis, system design, implementation, testing, and evaluation, to develop a web-based information platform. The sequential development process was considered appropriate because the principal operational problems and functional requirements had been identified before system implementation.

The developed system integrated transaction management, daily QTY recording, recapitulation, financial reporting, invoice generation, dashboard monitoring, and role-based access control within a centralised platform. Yoshikuni et al. (2023) found that integrating information-system infrastructure with accounting information systems supports information processing and improves decision-making performance, while Plekhanov et al. (2023) identified process integration and automation as important organisational consequences of digital transformation. In the present

study, HTML, CSS, and JavaScript were used for the frontend, while PHP provided backend services connected to a MySQL database through a REST-style API. Local development was performed using Laragon with Apache, PHP, and MySQL before the application was deployed to a web-hosting environment. Two access roles, Owner and Staff, were implemented with different authorities to distinguish managerial monitoring from operational data-processing responsibilities. System performance was evaluated using Black Box Testing, Time Study, Motion Study, and Cost-Benefit Analysis (CBA) to examine functional, operational, and economic outcomes. Myers et al. (2012) emphasise that software testing should determine whether a system behaves as expected under specified test conditions. In contrast, recent studies on accounting digitalisation show that the consequences of digital systems should also be examined in terms of changes in activities, automation, and work processes (Pargmann et al., 2023; Perdana et al., 2023). Black Box Testing comprised 35 predefined scenarios covering authentication, transactions, reports, QTY management, recapitulation, invoices, dashboards, filtering, access control, and intermodule integration. A test was considered successful when the actual system response matched the predefined expected output, and functional validity was determined by the proportion of successful scenarios among all scenarios evaluated. Time Study and Motion Study were subsequently applied to determine whether system implementation produced measurable reductions in processing time and non-value-added activities. CBA completed the evaluation by assessing whether these measurable operational improvements generated economic benefits that exceeded the costs of system implementation.

$$\text{Functional Validity (\%)} = \frac{N_{\text{successful}}}{N_{\text{tested}}} \times 100$$

A time study compared the processing duration of the manual procedure and the implemented Financial Information System using two operational scenarios. Recent studies have demonstrated that time-based work measurement provides a systematic basis for identifying differences in processing duration and evaluating process improvements, particularly when activities are decomposed into observable work elements (Ji et al., 2022; Kim et al., 2021). Scenario 1 examined expenditure transaction recording involving 13 expenditure items, whereas Scenario 2 examined daily QTY management through invoice preparation and was divided into daily and monthly activities. Each activity was measured twice, and the mean duration was used for analysis, with activities classified as Operation (O), Inspection (I), or Delay (D) to distinguish active processing, verification, and waiting periods. Lead time was calculated as the mean duration of all activities within each process, and efficiency improvement was determined by comparing manual and system lead times, consistent with process-automation studies that evaluate operational improvements through reductions in processing time and manual effort (Perdana et al., 2023).

$$\text{Efficiency Improvement (\%)} = \frac{T_{\text{manual}} - T_{\text{system}}}{T_{\text{manual}}} \times 100$$

A motion study examined differences in the number and composition of actions required to complete the same processes. A motion was defined as a discrete observable action, including writing, typing, clicking, selecting a field or menu, moving between work media, sending messages, checking information, or revising data. Each motion was classified as value-added (VA) when it directly contributed to the required financial output or non-value-added (NVA) when it consumed effort without directly producing that output. Examples of NVA activities included duplicate recording, repeated checking, manual document formatting, file transfers through WhatsApp, and rework following corrections. The reduction in NVA activities was then calculated to evaluate workflow simplification after system implementation.

$$\text{NVA Reduction (\%)} = \frac{NVA_{\text{manual}} - NVA_{\text{system}}}{NVA_{\text{manual}}} \times 100$$

CBA was employed to evaluate the economic feasibility of implementing the Financial Information System over a one-year analysis period. Boardman et al. (2018) explain that Cost-Benefit Analysis requires that relevant costs and benefits be identified, monetised where possible, and compared over a consistent analytical period. In this study, implementation costs included hosting and domain expenses, system development operations, and field observation activities. At the same time, tangible benefits were estimated from labour-time savings identified through the Time Study. Processing-time savings were converted into monetary values using the labour cost per minute and the frequency of each activity within the corresponding operational period. Economic feasibility was subsequently assessed using the Benefit-Cost Ratio, with a value greater than 1 indicating that the monetised benefits exceed the costs included within the defined analytical boundary.

$$\text{Benefit}_i = \text{Time Saved}_i \times \text{Labor Cost per Minute} \times \text{Frequency}_i$$

$$\text{BCR} = \frac{\text{Total Benefit}}{\text{Total Cost}}$$

RESULTS AND DISCUSSION

The implementation of the web-based Financial Information System resulted in an integrated platform for managing the principal financial activities of PT Tri Yulida Sultra. The developed system incorporated authentication and role-based access, transaction management, financial reporting, daily QTY management, recapitulation, invoice generation, and an Owner dashboard. Data entered through the transaction module were connected to the reporting functions, while QTY data were processed through recapitulation and subsequently used to generate invoices. This integration replaced several previously separated activities performed through handwritten records, Microsoft Excel, and WhatsApp communication. The resulting system therefore established a centralized workflow for financial and operational data across the catering and laundry activities.

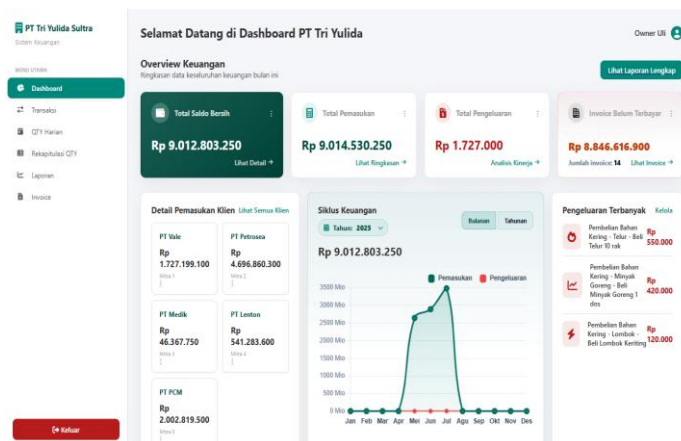


Figure 2. Financial Website PT Tri Yulida Sultra
Source: PT Tri Yulida Sultra, accessed in 2026.

Black Box Testing showed that all 35 predefined functional scenarios were completed. The evaluated functions covered authentication and authorisation, transaction and report management, QTY recording, recapitulation, invoice processing, dashboard indicators, filtering, and document download functions. In addition, the testing verified data continuity between transactions and reports as well as between QTY, recapitulation, and invoices. All actual outputs corresponded to the expected outputs specified in the testing scenarios, resulting in a functional validity rate of 100%. This result indicates functional conformity within the tested scenarios, rather than broader measures such as usability, user acceptance, or organisational effectiveness

Table 1. Summary of Black Box Testing Results

Evaluation	Result
Total test scenarios	35
Successful scenarios	35
Failed scenarios	0
Functional validity	100%

Time Study demonstrated a substantial reduction in processing time after the system's implementation. In Scenario 1, recording expenditure transactions required 21 minutes 43 seconds under the manual procedure and 8 minutes 13 seconds using the system. The difference represented a time saving of 13 minutes 30 seconds, corresponding to an efficiency improvement of 62.16%. The manual workflow required repeated recording, transferring information to Excel, verification, and communication via WhatsApp, whereas the implemented system consolidated several of these steps. Nevertheless, the improvement in Scenario 1 was lower than in Scenario 2 because individual expenditure items still had to be entered into the system separately. A larger reduction was observed in Scenario 2, particularly in activities previously associated with spreadsheet preparation and invoice generation. Daily QTY processing decreased from 46 minutes 45 seconds to 6 minutes 8 seconds, representing an efficiency improvement of 86.91%, while the monthly process decreased from 60 minutes 36 seconds to 5 minutes 33 seconds, representing an efficiency improvement of 90.84%. When both components were combined, total processing time decreased from 107 minutes 21 seconds to 11 minutes 41 seconds. This produced a total time saving of 95 minutes 40 seconds and an efficiency improvement of 89.12%. The greater improvement resulted from incorporating spreadsheet structuring, formula preparation, calculation, invoice formatting, document transfer, and several verification steps into the system workflow.

Table 2. Time Study Results

Scenario	Manual	System	Time Saving	Efficiency Improvement
Transaction Recording	21:43	08:13	13:30	62.16%
Total Scenario 1	21:43	08:13	13:30	62.16%
Daily QTY	46:45	06:08	40:37	86.91%
Monthly Invoice	60:36	05:33	55:03	90.84%
Total Scenario 2	107:21	11:41	95:40	89.12%

The motion study further showed that operational improvement was not solely determined by the total number of actions but also by changes in their composition. Based on the detailed motion tables for Scenario 1, the manual procedure comprised 140 motions, consisting of 57 VA and 83 NVA motions, while the system also required 140 motions, comprising 130 VA and 10 NVA motions. Thus, the total number of motions remained unchanged, but NVA activities declined from 83 to 10 motions, equivalent to an 87.95% reduction. The unchanged total occurred because the system still required individual entry of 13 expenditure items, generating 130 core data-entry motions. The main improvement therefore resulted from replacing duplicate recording, manual calculations, repeated verification, and cross-media activities with actions directly associated with transaction processing. In Scenario 2, the reduction occurred in both total motions and NVA activities. The manual QTY-to-invoice workflow required 725 motions, of which 133 were classified as NVA, whereas the system required 619 motions with 22 NVA motions. The implementation therefore eliminated 106 motions, representing a 14.62% reduction in total motions, while NVA activities decreased by 83.46%. The largest remaining workload under both conditions was daily QTY entry, which alone accounted for 558 motions, as 279 fields still required direct data entry. Consequently, the system achieved its main workflow gains by eliminating file preparation, spreadsheet formatting, formula construction, manual invoice preparation, document transfer, and repeated revisions, rather than removing the primary data-entry activity itself.

Table 3. Motion Study Results

Scenario	Manual Motions	System Motions	Manual NVA	System NVA	NVA Reduction
Transaction Recording	140	140	83	10	87.95%
QTY–Invoice Management	725	619	133	22	83.46%

The operational improvements identified through the Time Study were subsequently translated into measurable economic benefits. The total implementation cost was IDR 1,195,000, comprising IDR 500,000 for one year of hosting and domain services, IDR 540,000 for three months of website development operations, and IDR 155,000 for five field observation visits. Using a labour cost of IDR 236 per minute, Scenario 1 generated an estimated monthly benefit of IDR 95,580, while the daily and monthly components of Scenario 2 generated IDR 287,580 and IDR 12,992, respectively. Total tangible benefit therefore reached IDR 396,152 per month. When annualised over the one-year analytical period, the measurable tangible benefit amounted to IDR 4,753,824. The Cost-Benefit Analysis yielded a Net Benefit of IDR 3,558,824 after comparing the annual tangible benefit with the total implementation cost. The resulting Benefit-Cost Ratio (BCR) was 3.98, indicating that each IDR 1 of implementation cost corresponded to IDR 3.98 in monetised benefits over the defined one-year analytical period. In addition to these monetised benefits, the study identified non-monetised improvements, including shorter verification delays, reduced rework, and more centralised data processing. Taken together, the results show three distinct outcomes: functional conformity was demonstrated through Black Box Testing, operational efficiency through Time and Motion Studies, and economic feasibility through CBA. These findings should therefore be interpreted in light of the evaluated processes and assumptions, rather than as evidence of broader organisational effectiveness that was not directly measured in this study.

Table 4. Cost-Benefit Analysis Results

Indicator	Result
Total Implementation Cost	IDR 1,195,000
Tangible Benefit per Month	IDR 396,152
Tangible Benefit per Year	IDR 4,753,824
Net Benefit	IDR 3,558,824
Benefit-Cost Ratio (BCR)	3.98
Economic Criterion	Feasible (BCR > 1)

The findings indicate that implementing the web-based Financial Information System improved financial management by integrating previously fragmented activities into a centralised workflow. Transaction recording, daily QTY management, recapitulation, reporting, invoice preparation, and managerial monitoring could be performed within interconnected modules rather than through separate records and communication media. This finding is consistent with Christian et al. (2022), who reported that a web-based financial recording system improved the effectiveness of financial transaction management, and Rahmatika and Martyas Edi (2022), who found that web-based financial information systems facilitated more efficient financial administration and faster report preparation. Isma et al. (2024) similarly showed that integrated data processing and improved information accessibility contribute to better financial management performance. These similarities suggest that the principal value of web-based financial systems lies not merely in digitising records, but in connecting previously separated financial activities into a more coherent information flow. The functional performance of the developed system further supports its suitability for the financial processes examined in this study. The successful operation of authentication, role-based access, transaction management, reporting, QTY management, recapitulation, and invoice functions demonstrates that the system architecture was capable of supporting the intended operational workflow. This result is consistent with Christian et al. (2022)

and Isma et al. (2024), whose web-based financial systems were also reported to improve transaction processing and financial reporting through integrated data management. However, functional conformity should not be interpreted as evidence of complete organisational effectiveness, because Black Box Testing primarily establishes whether predefined functions behave as expected. User acceptance, satisfaction, decision quality, and long-term organisational outcomes therefore remain separate dimensions that require additional evaluation.

The Time Study findings indicate that the magnitude of operational improvement depended on the structure of the process being digitalised. Transaction recording continued to require direct input of individual source data, meaning that some user effort remained essential even after the system was implemented. In contrast, QTY management and invoice preparation contained more repetitive supporting activities that could be incorporated into an integrated workflow, including recapitulation, calculation, document preparation, and information transfer. This interpretation is consistent with Waziana and Saputra (2023), who reported that web-based financial administration improves reporting efficiency and processing speed through integrated data management, and with Isma et al. (2024), who associated web-based financial systems with reduced manual processing workloads. The findings therefore suggest that greater efficiency gains are likely to occur in processes where a larger proportion of administrative work is structured, repetitive, and suitable for system integration. The Motion Study provides additional evidence that workflow improvement should not be judged solely by whether the total number of actions decreases. Some core activities, particularly the entry of transaction and operational data, remain necessary because the system cannot generate source information independently from actual business activities. The main change occurred in the supporting workflow, where duplicate recording, manual calculation, repeated document preparation, cross-media transfer, and unnecessary verification could be reduced or eliminated. This finding is consistent with Wibowo et al. (2022), whose web-based cash management system for a catering business improved financial recording efficiency and data organisation, and Haryadi et al. (2025), who showed that web-based systems can support more efficient operational management in catering services. Accordingly, digitalisation in this context should be understood as a redistribution of work toward activities that directly contribute to the required financial output rather than simply as a reduction in every user action.

The integration of QTY data, financial recapitulation, and invoice preparation represents a particularly important aspect of the workflow redesign. Under fragmented processing, the same operational information may need to be transferred, reformatted, recalculated, or verified across different documents before becoming a usable financial output. Once these processes are connected, data entered at an earlier stage can be reused by subsequent modules, reducing the need to manually recreate information. Sarfiah et al. (2023) similarly found that web-based financial reporting applications can support more accurate and structured financial reporting for MSMEs, while Rahmatika and Martyas Edi (2022) emphasised improved calculation, monitoring, and financial-data management through web-based systems. The present study extends these findings by demonstrating how operational data from catering and laundry activities can be integrated with financial processing and invoice preparation within a single system, rather than being treated as isolated administrative functions.

Taken together, the Time and Motion Study findings support the proposed relationship between system integration and operational efficiency. The system did not improve efficiency simply because financial activities were transferred from paper or spreadsheets to a website; improvement emerged because several disconnected stages were reorganised into a continuous data-processing flow. This interpretation is consistent with Verhoef et al. (2021), who explain that digital transformation involves changes in organisational processes and value-creation mechanisms rather than the mere adoption of digital technologies. Plekhanov et al. (2023) further emphasise that process transformation is a central dimension of digital transformation, as digital technologies enable organisations to restructure activities, integrate information flows, and reduce inefficiencies stemming from fragmented procedures. In the present study, this principle was reflected in the linkage among transaction recording, QTY management, recapitulation, reporting, and invoice

generation, thereby allowing information to flow across related financial processes without repeated reconstruction in separate working media. The contribution of this study therefore lies in demonstrating how process integration can translate into measurable workflow improvements within the combined catering and laundry operations of PT Tri Yulida Sultra.

The economic evaluation complements the operational findings by showing that process improvement can also produce measurable organisational value. In this study, economic benefits were derived from labour-time savings associated with more efficient work processes rather than from assumed increases in sales or company revenue. This relationship is consistent with Grados-Espinoza and Velasquez-Jimenez (2025), who reported that digital financial management software can generate economic benefits through improved resource utilisation and operational performance. Waziana and Saputra (2023) and Isma et al. (2024) likewise associate integrated financial systems with reduced administrative burdens and more efficient processing, providing a plausible mechanism through which operational improvements can translate into financial value. Nevertheless, the economic feasibility identified in this study remains dependent on the specific costs, labour conditions, activity frequencies, and analytical period used in the evaluation. Several limitations should be considered when interpreting the findings. The research was conducted within a single company with financial workflows specific to catering and laundry services, so organisations with different transaction structures, approval procedures, staffing arrangements, or existing technologies may experience different outcomes. Furthermore, the present study focused on functional, operational, and economic evaluation and did not formally assess user acceptance or sustained system use. This aspect is important because Aris et al. (2024) found that perceived usefulness and perceived ease of use influenced behavioural intention toward an information system, while behavioural intention subsequently affected actual system use. Centralised information processing also introduces dependencies on network availability, correct user input, appropriate access control, user competence, and continued system maintenance, meaning that reducing fragmentation does not eliminate operational risk. Future studies should therefore complement efficiency measurements with user acceptance evaluation, longitudinal assessment of system use, data accuracy testing, security evaluation, and multi-user performance analysis.

CONCLUSION

This study demonstrates that implementing a web-based Financial Information System can improve the efficiency of financial management at PT Tri Yulida Sultra by integrating transaction recording, daily QTY management, recapitulation, reporting, invoice generation, dashboard monitoring, and role-based access into a centralised platform. Across the evaluated scenarios, the system met the predefined functional requirements and achieved measurable improvements in processing time, workflow structure, and economic feasibility. These findings indicate that the benefits of digitalisation were primarily generated through process integration, reduced dependence on fragmented working media, and the elimination of unnecessary administrative activities rather than through the complete removal of human input.

The main contribution of this study, therefore, lies not only in developing a financial information system for catering and laundry operations but also in demonstrating a multidimensional evaluation approach that links functional validity, operational efficiency, workflow improvement, and economic feasibility. The findings should nevertheless be interpreted within the operational conditions and analytical boundaries of PT Tri Yulida Sultra. The study did not directly evaluate user acceptance, long-term system performance, decision quality, cybersecurity, data accuracy over extended use, or broader organisational performance; therefore, functional and operational improvements should not be interpreted as evidence of complete organisational effectiveness. From a practical perspective, the system provides a basis for more centralised and traceable financial administration, particularly for service businesses that manage repetitive transactions and interconnected operational and billing processes. Future research should extend the evaluation through longitudinal observation, user acceptance assessment, security and data quality testing,

multi-user performance analysis, and replication in organisations with different business processes and transaction volumes.

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