Journal of Applied Business, Taxation and Economics Research (JABTER)
Vol. 4, No. 6, August 2025 (Page: 961-975) P-ISSN 2828-4976
DOI: 10.54408/jabter.v4i6.465 E-ISSN 2808-263X

Improving ERP Implementation Phase through BPM and BPMN: A Case from Indonesia

Firzainy Jiddan Mustofa[1*], Liane Okdinawati[2] Fransisca Budyanto Widjaja[3]

[1*,2,3]School of Business and Management, Institut Teknologi Bandung, Indonesia

Corresponding Author: 29123320@mahasiswa.itb.ac.id [1*)]

Keywords **:** *ERP implementation, Business process Management, Activity Based Model, BPMN, ESIA,*

Abstract: This study aims to evaluate and improve the business processes involved in the ERP implementation phase of a local Indonesian provider, with a specific focus on the master data preparation stage. Utilizing an integrated framework combining Business Process Management (BPM), Business Process Model and Notation (BPMN), the Activity-Based Model, and the ESIA method, this research identifies key bottlenecks caused by sequential data input processes and lack of integration among activities. The proposed business process redesign emphasizes parallel data input, document simplification, and automation of verification and validation, which are expected to accelerate implementation time, enhance data accuracy, and optimize operational efficiency. This study contributes empirically to an in-depth business process analysis within the Food and Beverage (F&B) sector and highlights the importance of proper process modelling and targeted automation to address common challenges faced by local ERP providers. Limitations include a focus on a single ERP implementation phase and a single case study, with the redesign not yet tested through simulation. Future research is recommended to expand the scope to other implementation phases, integrate quantitative performance metrics, and utilize simulation software to evaluate the effectiveness of the proposed process redesign.

P-ISSN 2828-4976
E-ISSN 2808-263X

Introduction

Business process refers to a series of interrelated activities systematically executed to transform inputs into outputs that deliver added value to both customers and organizations (Dumas et al., 2013). Business processes encompass not only internal organizational activities but also interactions with customers, suppliers, and other stakeholders, thereby forming a workflow that supports the comprehensive achievement of strategic organizational goals (Zairi, 1997). Effective business process management enables organizations to improve operational efficiency, service quality, and customer satisfaction by adopting a process-oriented approach rather than focusing solely on departmental functions (Stoiljković Ranđelović et al., 2018).

To optimize business processes, Enterprise Resource Planning (ERP) systems have emerged as integrated information systems that consolidate various business modules, such as production, finance, and human resources into a unified platform supported by a common database (Ullah et al., 2017; Tarhini et al., 2015). ERP aims to align and automate cross-functional processes to enhance organizational efficiency, transparency, and data-driven decision-making (Syamsuddin et al., 2023). However, ERP implementation often encounters multiple challenges, including resistance to change, technical complexity, and intensive project management demands (Tarhini et al., 2015; Rajapakse & Thushara, 2023). Failure factors such as inadequate top management support and insufficient training are commonly cited barriers, especially within small and medium-sized enterprises that typically face resource constraints (Zach et al., 2014).

Business Process Management (BPM) is introduced as a systematic approach to comprehensively managing business processes, encompassing stages of identification, discovery, analysis, redesign, monitoring, and control (Dumas et al., 2013). BPM emphasizes not only technological automation but also organizational cultural change and governance that foster continuous improvement and value creation for customers (Stoiljković Ranđelović et al., 2018). The success of BPM implementation depends on balancing technical and social aspects, including management involvement, cross-departmental collaboration, and rigorous process performance monitoring with relevant indicators (van der Aalst et al., 2016).

The BPM lifecycle provides a holistic framework capable of enhancing operational effectiveness and flexibility while improving organizational responsiveness to dynamic business environments (Teixeira et al., 2024). This approach also supports integration with ERP systems, generating optimal synergy between information technology and business process management (Syamsuddin et al., 2023). As a primary tool in BPM execution, Business Process Model and Notation (BPMN) serves as the standard for business process modeling by offering intuitive graphical notations to document, analyze, and effectively communicate processes (Dumas et al., 2013).

Beyond improving process comprehension and communication, BPMN also supports model validation and identification of bottlenecks or inefficient repetitions, making it an effective tool to drive continuous process improvement (Dumas et al., 2013; van der Aalst et al., 2016). The integration of BPMN with ERP and other automation technologies forms a

strategic foundation for organizations to achieve operational excellence and maintain long-term competitiveness.

Although numerous studies have addressed BPM, ERP, and BPMN either independently or in an integrated manner, prior research generally focuses on broad success factors or conceptual aspects of implementation (Tarhini et al., 2015; Stoiljković Ranđelović et al., 2018). In contrast, empirical investigations into specific obstacles encountered during critical ERP implementation phase, particularly activities related to business processes such as master data preparation remain limited, especially within the context of local ERP providers in Indonesia (Rajapakse & Thushara, 2023; Syamsuddin et al., 2023). Accordingly, this study aims to fill this gap by analyzing and visualizing bottlenecks during the master data preparation phase using BPM and BPMN approaches, thereby designing more effective and targeted process improvements.

Grounded in the BPM and BPMN theoretical framework, this study examines a case involving Eresto, a local Indonesian ERP provider, which experienced significant challenges during ERP implementation at Rumah Makan Sunda. The main challenge was a delay in business process activities, particularly in the master data preparation phase, which was expected to be completed within two months but in reality extended to six months. This time gap created a significant discrepancy between planning and execution, resulting in failure to achieve the intended implementation objectives.

The delay was attributable to ineffective and inefficient execution of business process activities. This research focuses on identifying and mapping these bottlenecks with the objective of providing recommendations for process improvements oriented toward optimal outcomes.

This article is structured as follows: the literature review covers relevant theories and prior research on BPM, ERP, and BPMN; the methodology section describes the research approach and analytical techniques employed; the results and discussion section presents key findings from the case study along with proposed improvement strategies; and the conclusion summarizes insights and offers recommendations for future research and ERP implementation practices in the Indonesian local context.

Research Method

This study employs Business Process Management (BPM) as the primary framework to systematically and continuously analyze and improve the ERP implementation process. BPM comprises several key stages: process identification to determine critical processes that require improvement; process discovery or mapping using Business Process Model and Notation (BPMN), an international graphical standard developed by the Object Management Group (OMG) that facilitates clear and consistent visualization of activities and workflows, process analysis to evaluate value-added and non-value-added activities as well as identify obstacles that reduce efficiency, process redesign by applying Andersen's (2007) ESIA method (Eliminate, Simplify, Integrate, Automate), aimed at eliminating unnecessary activities, simplifying workflow steps, integrating related activities, and automating repetitive tasks to

P-ISSN 2828-4976
E-ISSN 2808-263X

enhance effectiveness; implementation of the redesigned process within the organizational environment; continuous monitoring and control to measure process performance; and ongoing improvement to ensure business processes remain optimal, adaptive to change, and aligned with the organization's strategic objectives (Dumas et al., 2013; Object Management Group, 2011; Andersen, 2007).

Furthermore, this study adopts the Activity-Based Model developed by Agrawal, Rezaee, and Pak (2006), which emphasizes activity analysis within the value chain by classifying activities into four categories: value-added and essential, value-added but non-essential, non-value-added but essential, and non-value-added and non-essential.

This classification assists in identifying waste activities that should be eliminated and non-essential activities that can be minimized, while associating costs with each activity to prioritize improvements based on their value contribution and cost impact. The data used in this research were obtained from interviews with stakeholders and documented historical ERP implementation data. By integrating BPM, BPMN, the Activity-Based Model, and the ESIA method, this study aims to conduct a structured analysis and improvement of the ERP implementation process.

Result and Discussion

Process Identification

The identification phase in Business Process Management (BPM) refers to the stage where key business processes are recognized and selected for analysis and potential improvement. In this study, the focus is placed on the ERP implementation phase, which comprises multiple interrelated business process activities that are critical to the successful deployment of the system. As illustrated in Figure 1 ,this phase involves a sequence of technical and organizational tasks ranging from master data preparation, system trial and simulation, system usage preparation, system go-live.

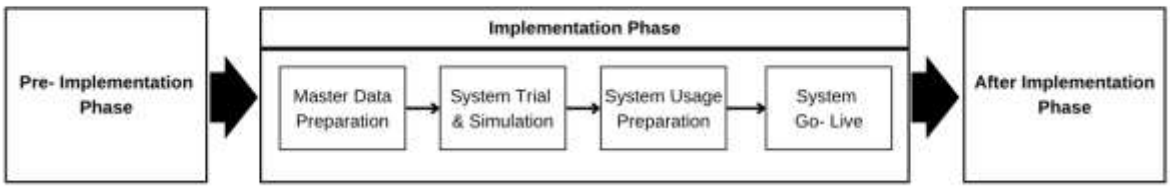

Figure 1. ERP Implementation Phase of Eresto

Process Discovery

The process discovery is specifically focused on the ERP implementation phase at Rumah Makan Sunda. The modelling was conducted using the Business Process Model and Notation (BPMN) standard to ensure clarity and consistency in process visualization.

Based on interviews with the Account Manager at Eresto, it was identified that one of the most critical and fundamental activities during the ERP implementation phase is Master Data Preparation. This activity involves various essential data inputs, such as user data and access

rights, division and outlet data, Chart of Accounts (CoA) data, product and category data, inventory and unit data, product recipe and production data, supplier and price list data, member and member category data, discount and promotion data, asset data, as well as expense types and vendor inputs. These data sets subsequently form the master data within the ERP system, serving as the primary reference for Rumah Makan Sunda's operational activities going forward.

This process engages multiple stakeholders from both Eresto, such as the Account Manager, Project Manager, Software Developer, and Rumah Makan Sunda, including the Backoffice Admin, relevant Division Admins, and the Operation Manager.

The process holds critical importance as it directly impacts the accuracy of system configuration and ensures data integrity across all ERP modules. Given its significance, the Master Data Preparation process was selected as the main focus for analysis and redesign in this study. The detailed workflow of this process is illustrated in Figure 2, which forms the basis for the subsequent process analysis phase.

Process Analysis

Process Analysis is a critical stage within the Business Process Management (BPM) lifecycle aimed at gaining an in-depth understanding of the ongoing business process, identifying bottlenecks, and uncovering opportunities for improvement. In the context of ERP implementation, this stage specifically emphasizes all activities involved in master data preparation, which is pivotal to the overall smoothness of the implementation process. Through this analysis, the organization can classify activities based on their contribution to value addition, non-value-added activities, and those causing delays or inefficient resource utilization. Interview findings with the Account Manager revealed that the activities within the process are interdependent, such that delays in one step can significantly affect the performance of subsequent activities. Therefore, improvement efforts are focused on minimizing potential delays to ensure that all activities are conducted efficiently and effectively.

During the analysis, the method employed to map and classify activities is the Activity-Based Model proposed by Agrawal et al. (2006), which categorizes activities into four groups: value-added and essential, value-added but non-essential, non-value-added but essential, and non-value-added and non-essential. This classification aids in identifying waste activities that should be eliminated and non-essential activities that can be minimized, while associating costs to each activity to determine improvement priorities based on value contribution and cost impact. The results of this analysis are visualized in diagrams and tables illustrating activity distribution and potential improvements. The activity matrix is presented in Figure 3, with detailed explanations provided in Table 1.

P-ISSN 2828-4976
E-ISSN 2808-263X

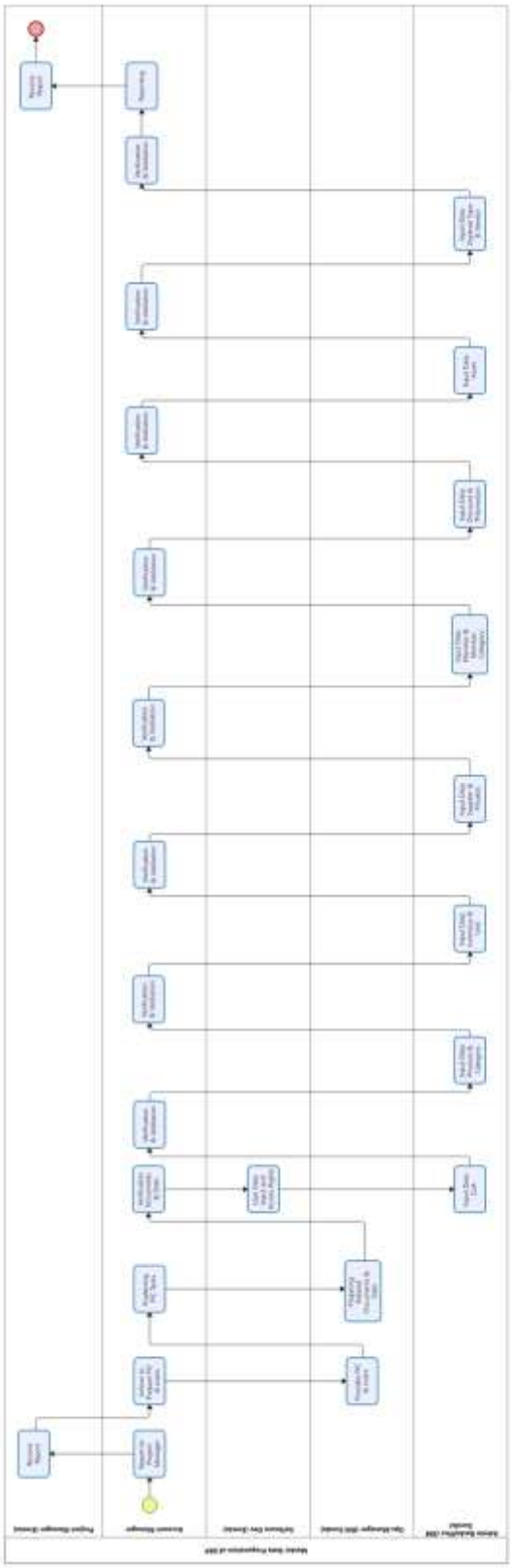

Figure 2. Business Process of Master Data Preparation

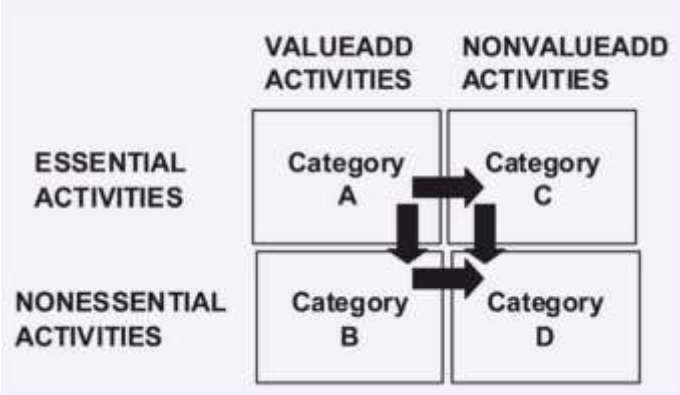

Figure 3. Activity Based Model Matrix

Source: Agrawal (2006)

Table 1. Matrix Explanation

Category	Explanation
Category A	Value-added and essential activities. These are core processes that should be maintained and optimized.
Category B	Value-added but non-essential. Should be re-evaluated; may only be relevant in specific contexts.
Category C	Non-value-added but essential. Typically includes compliance or administrative tasks. Should be minimized.
Category D	Non-value-added and non-essential. Should be eliminated as they waste resources and add no value.

Source: Agrawal (2006)

A detailed classification of the key business processes involved in the master data preparation phase of ERP implementation can be seen in Table 2. Each activity is categorized based on its value contribution and level of essentiality, distinguishing between value-added and essential activities, value-added but non-essential activities, non-value-added but essential activities, and non-value-added and non-essential activities.

Table 2. Business Process Category Analysis.

Business Process **PIC and Documents Preparation**	**Category**	**Classification**	**Explanation**
Reporting	C	Non-Value Added & Essential	Reporting does not directly add output but is important for project control and decision-making.
Preparing Main PIC	A	Value Added & Essential	Appointing PIC ensures clear responsibility and smooth coordination, directly impacting outcomes.

P-ISSN 2828-4976
E-ISSN 2808-263X

Explaining PIC Tasks	A	Value Added & Essential	Ensures PIC understands roles and responsibilities to avoid errors and obstacles during task execution.
Preparing Related Documents & Data	C	Non-Value Added & Essential	Documents are important for subsequent processes and regulatory compliance, though they do not add direct value.
User Data Input and Access Rights			
Inputting User Data	B	Value Added & Non-Essential	Supports system security and access control.
Chart of Accounts Data Input			
Inputting Data	B	Value Added & Non-Essential	Main activity that can be improved through automation, simplification, or integration.
Verification and Validation	C	Non-Value Added & Essential	Important to ensures correctness of entered data to prevent errors
Product and Category Data Input			
Inputting Data	B	Value Added & Non-Essential	Main activity that can be improved through automation, simplification, or integration.
Verification and Validation	C	Non-Value Added & Essential	Important to ensures correctness of entered data to prevent errors
Inventory and Unit Data Input			
Inputting Data	B	Value Added & Non-Essential	Main activity that can be improved through automation, simplification, or integration.
Verification and Validation	C	Non-Value Added & Essential	Important to ensures correctness of entered data to prevent errors
Supplier and Pricelist Data Input			
Inputting Data	B	Value Added & Non-Essential	Main activity that can be improved through automation, simplification, or integration.
Verification and Validation	C	Non-Value Added & Essential	Important to avoid errors in pricing and supplier data entry.
Member and Member Category Data Input			
Inputting Data	B	Value Added & Non-Essential	Main activity that can be improved through automation, simplification, or integration.
Verification and Validation	C	Non-Value Added & Essential	Ensures correctness of entered data to prevent errors.

Discount and Promotion Data Input			
Inputting Data	B	Value Added & Non-Essential	Main activity that can be improved through automation, simplification, or integration.
Verification and Validation	C	Non-Value Added & Essential	Important to ensures correctness of entered data to prevent errors
Asset Data Input			
Inputting Data	B	Value Added & Non-Essential	Can be automated for faster and accurate data entry.
Verification and Validation	C	Non-Value Added & Essential	Important to ensures correctness of entered data to prevent errors
Expense Type and Vendor Data Input			
Inputting Data	B	Value Added & Non-Essential	Main activity that can be improved through automation, simplification, or integration.
Verification and Validation	C	Non-Value Added & Essential	Important to ensures correctness of entered data to prevent errors
Reporting	C	Non-Value Added & Essential	Reporting and monitoring are vital for project evaluation and control though they do not add direct value.

The results shows that no activities fall into category D (non-value-added and non-essential). The activities are grouped into categories A, B, and C. Category A includes essential value-added tasks critical for success, category B covers value-added but non-essential tasks that can be improved, and category C consists of non-value-added but necessary tasks for control and verification. This indicates the process has vital core activities alongside supporting tasks that could be made more efficient.

Process Redesign

The process redesign phase aims to restructure business processes by eliminating inefficiencies and enhancing value creation through the simplification, integration, and automation of activities. The goal is to make processes more efficient, faster, and adaptable to changing organizational and customer needs (Dumas et al., 2013).

The ESIA method (Eliminate, Simplify, Integrate, Automate) developed by Andersen (2007) is employed as a systematic approach for redesign. ESIA facilitates the removal of unnecessary activities, streamlines workflows, consolidates related tasks, and automates repetitive duties to improve overall business process efficiency and effectiveness.

In applying the ESIA method, only categories B and C are targeted for improvement since category A activities are considered already optimal and deliver significant value.

P-ISSN 2828-4976
E-ISSN 2808-263X

Category B consists of value-added but non-essential activities, whereas category C includes non-value-added but essential activities that require refinement or minimization to enhance process efficiency. These activities are prioritized for redesign to be eliminated, simplified, integrated, or automated following ESIA principles. Table 3 presents a list of business processes classified under the ESIA categories, providing a clear overview of the key process areas targeted for improvement.

Table 3. ESIA Analysis

Business Process	Category	Eliminate	Simplify	Integrate	Automate
Input User Data and Access Rights	B			V	
Input Chart of Account (CoA) Data	B			V	
Input Product and Category Data	B			V	
Input Inventory and Unit Data	B			V	
Input Supplier and Pricelist Data	B			V	
Input Member and Member Category Data	B			V	
Input Discount and Promotion Data	B			V	
Input Asset Data	B			V	
Input Expense Types and Vendor Data	B			V	
Document Preparation	C		V		V
Verification and Validation	C		V		V
Report	C		V		

The table classifies various business processes into categories B and C according to the ESIA method application. Activities in category B, primarily data input tasks such as user data, access rights, chart of accounts, product, inventory, supplier, member, discount, asset, and expense types, are managed through integration strategies that enable these activities to run in parallel. The objective is to save time and shorten the process duration to prevent delays in the implementation phase. Meanwhile, activities in category C such as document preparation, verification and validation, and reporting that do not add direct value are addressed through simplification and automation. Simplifying formats and automating these administrative activities aim to enhance process speed and efficiency while reducing the likelihood of errors, as these tasks do not directly contribute to the final output's value. This approach reflects the ESIA focus on eliminating waste and improving the overall workflow of business processes.

Based on the analysis using the ESIA method, a new business process redesign will be developed for the master data preparation stage in the ERP implementation phase, as illustrated in Figure 4.

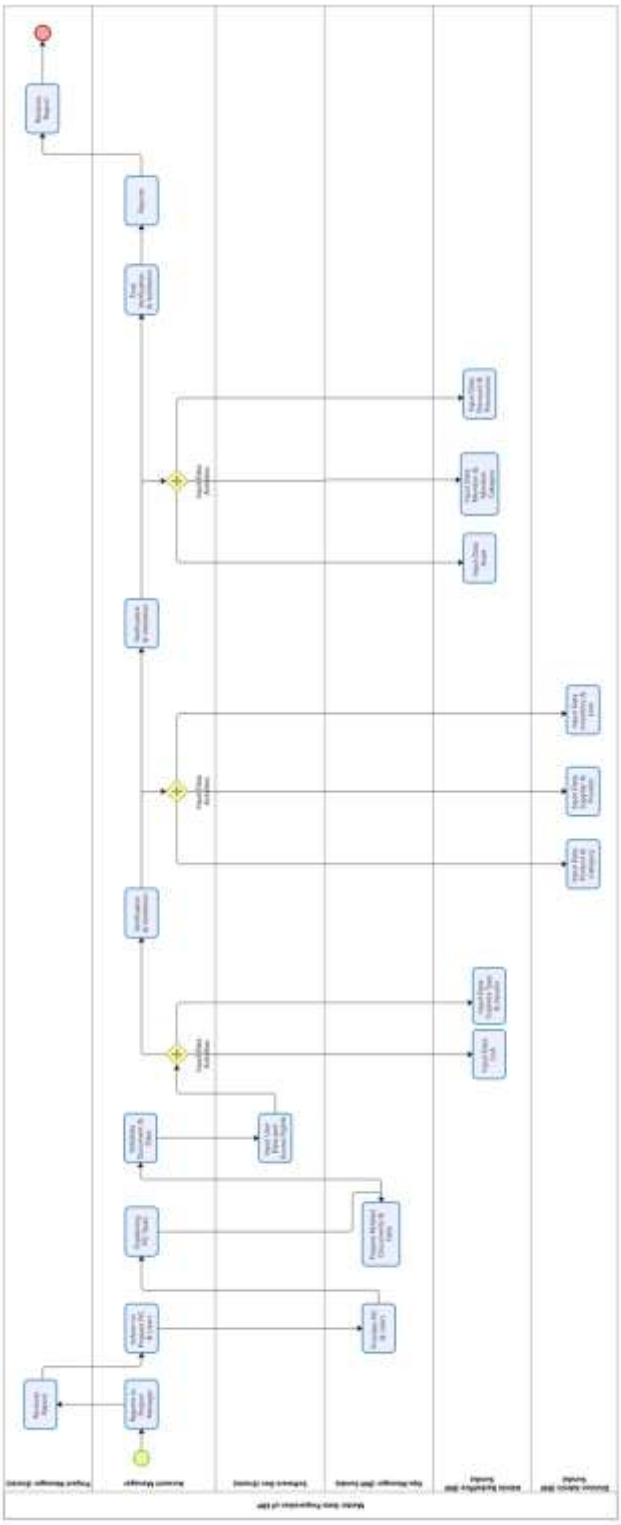

Figure 4. New Business of Master Data Preparation

Process Implementation

Process implementation is the execution phase of a business process that has been designed or redesigned, aimed at ensuring the process operates effectively and efficiently in alignment with organizational strategy. Successful implementation of a redesigned business process, particularly within the context of Enterprise Resource Planning (ERP) systems, requires thorough preparation encompassing critical success factors (CSFs) such as top

P-ISSN 2828-4976
E-ISSN 2808-263X

management support, user involvement, adequate training, effective communication, and readiness of technology and infrastructure (Tarhini et al., 2015; Rajapakse & Thushara, 2023). These factors are essential to overcome implementation barriers and ensure seamless integration of business processes with ERP systems, thereby enabling optimal achievement of organizational goals (Syamsuddin et al., 2023).

The success of implementation heavily relies on comprehensive management and integration of data inputs, including user data and access rights, Chart of Accounts (CoA), product and category data, inventory and units, suppliers and price lists, members and member categories, discounts and promotions, assets, as well as expense types and vendors. In the redesigned business process, data input activities across various ERP modules are executed in parallel to accelerate processing time and reduce delays commonly caused by sequential data entry. This approach is supported by increasing client-side human resources with fit requirements, allowing higher data input volumes and concurrent processing. Proper data integration ensures systematic organization within the ERP system, minimizing risks of duplication and errors while facilitating smooth subsequent business processes.

Moreover, document preparation and the verification and validation processes are critical factors that can be optimized through automation. Document preparation is automated by providing digital formats and comprehensive templates, enabling clients to simply complete the data according to standardized formats, thereby reducing manual entry and human error. Automated verification and validation mechanisms using integrated IT platforms allow real-time data checks, decreasing manual errors and accelerating inconsistency detection, thus enhancing process responsiveness and flexibility. Reporting processes are also simplified to enable rapid preparation of reports that are easily understood by all stakeholders. The use of specialized applications and structured Standard Operating Procedures (SOPs) standardizes and partially automates reporting, producing transparent and relevant outputs that facilitate periodic performance monitoring through clearly defined Key Performance Indicators (KPIs). Through strong integration of comprehensive data input, automated document preparation and verification, and simplified reporting, the business process implementation can proceed smoothly and effectively support the organization’s objectives.

Process Monitoring & Control

Following the redesigned and parallel-executed business process implementation, several critical aspects require focused monitoring and control. One such aspect is the increased human resource (HR) involvement from the client side during data input. Given that a higher number of personnel may introduce variability in performance, it is essential to routinely monitor the performance of individuals and teams. When deviations or errors are detected, additional training must be promptly provided to ensure that personnel understand the established requirements and can perform in accordance with applicable Standard Operating Procedures (SOPs). This measure aims to minimize data input errors that could adversely affect process output quality and the overall effectiveness of the ERP system.

Moreover, the adoption of IT systems and supporting software also demands particular attention in monitoring and control activities. Key areas of focus include the software's compliance with business requirements, system performance stability, and routine maintenance activities to ensure optimal system operation. Monitoring should encompass periodic evaluation of automated verification and validation functions, as well as the accuracy and timeliness of process reporting. All these activities must be comprehensively assessed based on the implemented business process, utilizing relevant Key Performance Indicators (KPIs) at each process stage.

Accordingly, monitoring and control serve not only as oversight mechanisms but also as adaptive and continuous improvement tools to guarantee the smooth and successful implementation of business processes and ERP systems.

Conclusion

This study aims to evaluate and improve the business processes involved in ERP implementation at Eresto by adopting the Business Process Management (BPM) framework. It emphasizes the critical importance of the master data preparation phase as a key success factor in ERP system implementation, particularly within the context of local ERP providers such as Eresto and its client, Rumah Makan Sunda. By integrating BPM, Business Process Model and Notation (BPMN), the Activity-Based Model, and the ESIA method, the study successfully identifies bottlenecks caused by sequential data input processes and insufficient integration among activities. The proposed business process redesign, focusing on parallel data input, document simplification, and automated verification and validation, offers an effective improvement to accelerate implementation time, enhance data accuracy, and optimize operational efficiency.

This study also contributes empirically to the in-depth analysis of business processes in a specific phase of ERP implementation, using an integrated methodological framework applicable to the Food & Beverage (F&B) sector. The findings enrich the literature by focusing the analysis on master data preparation and highlighting the importance of appropriate process modelling and targeted automation to address common challenges in local ERP implementations.

However, this study has limitations, including its focus on only one phase of ERP implementation and reliance on a single case study, which restricts the generalizability of the findings. Additionally, it does not provide detailed discussions on standard operating procedures (SOPs), key performance indicators (KPIs), or the specific application of monitoring and automation tools beyond conceptual aspects.

For future research, it is recommended to expand the scope to other phases of ERP implementation and conduct multiple case studies across various sectors and ERP providers to enhance the validity and relevance of results. Integrating quantitative metrics through SOPs and KPIs supported by monitoring tools is expected to strengthen process evaluation. Furthermore, the proposed business process redesign has yet to be tested through

P-ISSN 2828-4976
E-ISSN 2808-263X

simulation; therefore, subsequent studies could utilize business process simulation software to assess the effectiveness of the redesign outcomes.

References

Agrawal, V., Rezaee, Z., & Pak, R. (2006). *Activity-based costing and performance management*. Journal of Accounting and Finance, 21(3), 45–63.

Andersen, B. (2007). Eliminate, simplify, integrate, automate (ESIA): A method for business process redesign. *Business Process Management Journal*, 13(3), 299–317. https://doi.org/10.1108/14637150710757066

Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2013). *Fundamentals of Business Process Management*. Springer.

Object Management Group. (2011). *Business Process Model and Notation (BPMN) Version 2.0*. https://www.omg.org/spec/BPMN/2.0/

Rajapakse, D. P. P. K., & Thushara, S. C. (2023). Critical failure factors in ERP implementation: A systematic literature review. *Journal of Business and Technology*, 7(1). https://doi.org/10.4038/jbt.v7i1.109

Stoiljković Ranđelović, A., Milojević, R., & Radosavljević, M. (2018). Identification and analysis of key business process management factors. *Economic Themes*, 56(1), 57–78. https://doi.org/10.2478/ethemes-2018-0004

Syamsuddin, S., Ilham, B. U., Dwiwijaya, K. A., Navianti, D. R., & Hadikusumo, R. A. (2023). Implementation of an enterprise resource planning (ERP) system and its impact on manufacturing company operational efficiency. *Global International Journal of Innovative Research*, 1(2), 194–199. https://doi.org/10.59613/global.v1i2.29

Tarhini, A., Ammar, H., Tarhini, T., & Masa'deh, R. (2015). Analysis of the critical success factors for enterprise resource planning implementation from stakeholders' perspective: A systematic review. *International Business Research*, 8(4), 25–46. https://doi.org/10.5539/ibr.v8n4p25

Ullah, A., et al. (2017). Enterprise resource planning (ERP) systems and ERP quality factors: A literature review. *International Journal of Advanced Computer Science and Applications*.

van der Aalst, W. M. P., La Rosa, M., & Santoro, F. M. (2016). Business process management: Don't forget to improve the process! *Business & Information Systems Engineering*, 58(1), 1–6. https://doi.org/10.1007/s12599-015-0409-x

Zach, O., Munkvold, B. E., & Olsen, D. H. (2014). ERP system implementation in SMEs: Exploring the influences of the SME context. *Enterprise Information Systems*, 8(2), 309–335. https://doi.org/10.1080/17517575.2012.702358

Teixeira, A. R., Ferreira, J. V., & Ramos, A. L. (2024). Optimization of business processes through BPM methodology: A case study on data analysis and performance improvement. *Preprints.org*. https://doi.org/10.20944/preprints202410.1248.v1