

## Design and Evaluation of a Localized HRM Module Integrated into MyERP Plus for Indonesian SMEs: A PIECES Framework Approach

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### ABSTRACT

This research aims to design and evaluate an integrated Human Resource Management (HRM) module for the MyERP Plus platform, focusing on the operational needs of small and medium-sized enterprises (SMEs) in Indonesia. Using a qualitative descriptive approach and the System Development Life Cycle (SDLC) model, the system was developed through stages of planning, analysis, and design. The evaluation was conducted using the PIECES framework, assessing six system quality dimensions. The results show an overall average score of 4.36, categorized as Very Satisfied, with the highest scores in Economy and Efficiency. These findings indicate strong system feasibility and support the relevance of ERP-based HRM modules in improving performance and reducing manual workload.

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## INTRODUCTION

As business function operating systems become more integrated through digital transformation to stay competitive, HRM must follow suit to advance from an administrative function to a facilitative resource aligned with a data-driven operational ecosystem. ERP utilization in Indonesia reflects such localized needs from MyERP Plus, a financial and supply chain management solution used by SMEs. Yet, it does not offer a complete offering of full-fledged localized support for HRM needs for compliance with regulations.

PT. Universal Big Data's (UBIG) reporting, 42% of MyERP Plus users are in manufacturing, and 32% of users are in trading. Thus, with such a high frequency of relevant enterprise classification, it is shocking to find that over 60% of SMEs still do not use an integrated HRM solution but rather, manual support or non-integrated applications to dual manage their obligations within HR. They do so to save time and ostensibly manage corporate regulatory compliance risk. However, this approach causes time waste and exposure to corporate regulatory compliance risk. Thus, this study aims to design a localized, integrated HRM module to work within MyERP Plus to incorporate attendance, payroll automation, and compliance with insurance (BPJS) and tax (PPh 21). It serves as a theoretical contribution with findings proper for a resource-constrained understanding of SMEs.

Addressing this problem fills the gap by designing an HRM module that is scalable and localized to operate within the confines of the MyERP Plus environment. The design will allow for employee data collection in one file with access without redundancy, real-time attendance validation, and automated payroll calculations with necessary reporting to insurance and tax authorities. In addition to technological contributions, this research is an ERP theoretical enrichment for the literature, with the solution created for representative SMEs where limited resources create an impediment to successful HR digitalization.

## THEORETICAL REVIEW

### *Enterprise Resource Planning (ERP) and Modular Architecture*

Enterprise Resource Planning (ERP) is a comprehensive system that brings together the main business processes, such as finance, inventory, procurement, and human resources, into one platform based on a centralized database (Solano & Cruz, 2024). Modular ERP architecture gives the potential for businesses to adopt separate components independently without causing disruption to the organization's integration across departments. For small and medium-sized enterprises (SMEs) that incrementally enhance their digital transformation, such flexibility is particularly advantageous. (Zhao & Tu, 2021).

In accounting information systems, modular ERP plays a fundamental role in enabling real-time transaction processing, financial reporting, and monitoring compliance (Gessa et al., 2023). Each module is designed to meet a specific business function and operates via common data structures and shared protocols, thus ensuring consistency and auditability in organizational data flows. Of specific emphasis in this research is the integration of the Human Resource Management (HRM) module and ERP's finance to enable the

automation of payroll journal postings and alignment with financial reporting (Ahmed et al., 2023).

### ***Human Resource Management Systems (HRMS) in ERP Context***

A Human Resource Management System (HRMS) consolidates several HR functions, such as employees' history, recruitment, payroll, attendance, and performance management, into one bundle of software (Asfahani, 2021). As integrated in ERP systems, HRMS is a strategic tool that supports not only administrative efficiency but also financial integration.

The smooth integration of payroll, benefits, and tax data into the accounting ledger is made possible by the administrative as well as strategic integration of HR processes into ERP systems, claims. (Romney & Steinbart, 2017). Internal control and external regulatory authorities depend on timely reporting, traceability in audits, and compliance, which are all offered by Amajuoyi et al. (2024). Their method, which rationalizes the incorporation of HR modules into ERP, remains basic within the accounting information systems literature.

### ***System Development Life Cycle (SDLC)***

The System Development Life Cycle (SDLC) is a process for constructing and implementing information systems in a systematic way. It includes stages such as planning, analysis, design, implementation, and evaluation. (Wandee et al., n.d.). In accounting information systems, SDLC ensures that all the modules developed, specifically payroll and HR modules, meet system integrity, regulatory compliance, and internal control needs.

This research applies SDLC in a bid to guide the design and development of MyERP Plus's overall HRM module. By using system modelling tools such as context diagrams, data flow diagrams (DFDs), and flowcharts, this research ensures that the system incorporates real-world workflows while adhering to accounting modules and user control mechanisms. (Meiryani et al., 2021). Use of SDLC also facilitates iterative verification with stakeholders for refining business logic, enhancing data accuracy, and conforming to internal audit policy.

### ***PIECES Framework for System Evaluation***

Despite being developed by Kendall & Kendall, (2014) The PIECES framework has developed into a trustworthy multi-criteria assessment instrument for IS success (Nafiisa et al., 2024). It enables the qualitative-quantitative evaluation of six variables, providing information on both strategic alignment and system performance.

An organized method for assessing and analyzing information systems, particularly in the early phases of system development, is the PIECES framework, which stands for Performance, Information, Economy, Control, Efficiency, and Service. Every element provides a unique viewpoint on how the system meets business requirements:

1. Performance evaluates response time, throughput, and system availability.

2. Information assesses the accuracy, relevance, and timeliness of data.
3. Economic measures promote cost efficiency and the reduction of resource use.
4. Control addresses security, audit trails, and error prevention.
5. Efficiency focuses on process streamlining and the reduction of redundancy.
6. Service relates to user interface quality, ease of use, and support.

This framework is widely adopted in accounting information systems research to assess system readiness and strategic impact. In this research, PIECES is applied as a scoring rubric to evaluate the feasibility and effectiveness of the designed HRM module. (Aditya & Jaya, 2022).

The PIECES framework is used to analyze both manual and computerized systems to identify operating problems to solve, review the level of users' satisfaction with the utilized information system, can capture the entire picture of the utilization of the system. (Febriansah & Abdillah, 2020). It enables total review and improvement recommendations, including the enhancement of the user interface and the improvement of audit trails. The adoption of a human resource management system has the capability to advance significantly and alleviate issues in human resources, especially in the hiring process, management of employee information, attendance tracking, and calculation for loan disbursement (Ololade et al., 2023).

### ***Related Research Gap***

Most of the research continues to concentrate on broad ERP deployment without adapting to localized compliance mechanisms like BPJS and PPh 21, despite recent efforts like Ahmed et al., (2023). This research tries to fill that context-specific gap. The design of HRM modules in larger ERP contexts has been studied in previous studies. Yohana et al. (2018), for example, suggested BPMN-based HR procedures in the RetGoo ERP, and Susati & Riyadi (2020) Looked at HR implementation with Odoo, emphasizing time efficiency and data security. Wibowo & Lavenia (2023) Examined how Hash mini ERP's HR automation is supported by REST API integration.

By providing a workable paradigm for automating HR procedures in SME environments while preserving alignment with financial reporting and legislative compliance, the solution adds to the body of knowledge in accounting information systems. (Johari et al., 2023).

### **METHODOLOGY**

This research adopts a qualitative descriptive approach, guided by the System Development Life Cycle (SDLC) model, a well-established framework for designing information systems through five structured phases: planning, analysis, design, implementation, and evaluation. (Kendall & Kendall, 2014). The primary objective is to design a Human Resource Management (HRM) module tailored for the MyERP Plus platform, with a focus on improving automation, operational efficiency, and regulatory compliance for small and medium-sized enterprises (SMEs) in Indonesia. (Li, 2021).

### ***Research Setting and Data Collection***

The research was conducted at PT. Universal Big Data, the developer of MyERP Plus. Data collection involved a combination of:

1. Semi-structured interviews with three stakeholders: one HR officer, one accounting and finance officer, and one ERP developer.
2. Document analysis, including payroll standard operating procedures (SOPs), tax and insurance compliance forms, and existing ERP documentation
3. Process observation of routine HR workflows such as payroll calculation, attendance reporting, and statutory reporting (BPJS and PPh 21).

These data sources provided a comprehensive understanding of business needs and process inefficiencies, forming the basis for system requirement analysis.

### ***System Design Approach***

The system was developed following the SDLC process, broken down into the following stages:

1. Planning & Analysis: Identification of core user needs, pain points, and regulatory requirements.
2. Design: Development of system models to visualize workflows and architecture, including:
  - a) Context diagram to define system boundaries and external entities,
  - b) Flowcharts mapping payroll automation and reporting workflows,
  - c) Process mapping to highlight existing inefficiencies and opportunities for automation.
3. Validation: Design verification through internal reviews and feedback from stakeholders to ensure functionality aligns with user expectations and system integration feasibility.

### ***PIECES Framework Analysis***

The PIECES model, covering Performance, Information, Economy, Control, Efficiency, and Service, was applied to evaluate system quality and feasibility. (Kendall & Kendall, 2014). Each dimension was broken into relevant sub-criteria and rated using a 5-point Likert scale of Satisfaction Levels, where 1 represents "Disagree" and 5 represents "Agree".

A weighted scoring system was implemented to reflect the relative importance of each component in the context of SME digital transformation. (Merdin et al., 2023). Table 1 outlines the rubric used for scoring.

Table 1. Likert Scale of Satisfaction Levels

Likert Scale	Score
Agree	5
Agree	4
Doubtful	3
Disagree	2
Disagree	1

Source: (Dyah et al., 2022)

The satisfaction levels and Likert scores are displayed in Table 1. Additionally, the PIECES calculation model will be used to calculate the data based on the Likert scale data recapitulation. PIECES computations are quite simple to comprehend. Thus, to ascertain the mean degree of contentment with PIECES, the investigator employs (Dyah et al., 2022):

$$Average\ Satisfaction = \frac{Number\ of\ Questionnaire\ Score}{Number\ of\ Questionnaires} \times 100\ \% \dots\dots (1)$$

The next stage is to ascertain the degree of satisfaction after the knowledge of the average level of satisfaction on each PIECES framework variable. The typical degree of contentment can be observed in Table 2.

Table 2. Conditions Of Satisfaction Level Criteria

Criteria	Score
Very Satisfied	4,2 -5
Satisfied	3,4 -4,19
Quite satisfied	2,6 -3,39
Dissatisfied	1,8 -2,59
Very Dissatisfied	1 -1,79

Source: Data Processed 2025

In addition to the scoring rubric presented in Table 2, this study also refers to alternative interpretations of satisfaction level criteria. Based on (Dyah et al., 2022) A score in the range of 3.4 to 4.91 is categorized as "Satisfied", while a score between 4.92 and 5.00 is classified as "Totally Satisfied". By applying these classification thresholds, the evaluation results not only reflect user perceptions

but also provide a benchmark for system developers to assess the quality and acceptance level of the proposed service system. This approach enables a clearer analysis of whether the designed HRM module meets expectations and where further refinement is needed.

## RESULTS

The PIECES framework was employed to measure system quality across six core dimensions: Performance, Information, Economy, Control, Efficiency, and Service. Each component was assessed through expert judgment using a 5-point Likert scale ranging from Very Dissatisfied (1) to Very Satisfied (5). The evaluation focused on how well the system's design meets business process requirements in human resources and accounting functions.

To facilitate clarity and detailed analysis, the evaluation results for each PIECES component are presented in separate tables by indicator. Each table includes the sub-criteria assessed, the average scores obtained from respondents, and an interpretation of satisfaction levels based on the scoring rubric.

Table 4. Satisfaction Score Recapitulation for Performance Indicator

Indicator	Sub-Criteria	Average Score
Performance	Payroll automation	4.8
	System responsiveness	3.9
	System availability	4.3
	<b>Total</b>	<b>13</b>
	<b>Average of questionnaires</b>	<b><math>13 \div 3 = 4.33</math></b>
	<b>Criteria</b>	<b>Very Satisfied</b>

Source: Data Processed 2025

A value of **4.33** was determined by calculating the average score for the Performance component. This score falls into the **Very Satisfied** category according to the PIECES framework interpretation scale.

This suggests that, regarding performance-related elements, including payroll automation, system responsiveness, and system availability, there is a high alignment between system capabilities and user expectations. With a score of 4.8, the payroll automation sub-criteria demonstrated the highest level of satisfaction, indicating stakeholders' faith in the proposed module's capacity to decrease manual labor and improve processing accuracy.

Table 5. Satisfaction Score Recapitulation for Information Indicator

Indicator	Sub-Criteria	Average Score
Information	Accuracy of HR and tax data	4.7
	Compliance with regulatory format	4.4
	Report accessibility	3.6
	<b>Total</b>	<b>12.7</b>
	<b>Average of questionnaires</b>	<b><math>12.7 \div 3 = 4.23</math></b>
	<b>Criteria</b>	<b>Very Satisfied</b>

Source: Data Processed 2025

A value of **4.23** was obtained for the Information component, which falls into the **Very Satisfied** category based on the PIECES framework. This indicates that the system is perceived to provide strong informational support for HR and accounting needs.

The highest score was in HR and tax data accuracy (4.7), reflecting stakeholder trust in the system's reliability. While regulatory compliance also scored well (4.4), the lower score in report accessibility (3.6) suggests a need for improvements in interface design to enhance data retrieval. Overall, the system shows a solid foundation in information handling, with minor adjustments needed to optimize accessibility.

Table 6. The Satisfaction Score Recapitulation for the Economy Indicator

Indicator	Sub-Criteria	Average Score
Economy	Reduction in manual effort	4.9
	Cost/time efficiency	5.0
	<b>Total</b>	<b>9.9</b>
	<b>Average of questionnaires</b>	<b><math>9.9 \div 2 = 4.95</math></b>
	<b>Criteria</b>	<b>Very Satisfied</b>

Source: Data Processed 2025

A score of **4.95** was recorded for the Economy component, the highest among all PIECES indicators, and categorized as **Very Satisfied**. This reflects strong user agreement that the system can effectively reduce manual workload and operational costs.

Cost/time efficiency received a perfect score (5.0), while manual effort reduction scored 4.9, highlighting confidence in the system’s automation of payroll, reporting, and compliance tasks. These results confirm the system’s value in enhancing efficiency, particularly for SMEs with limited resources.

Table 7. The Satisfaction Score Recapitulation for Control Indicator

Indicator	Sub-Criteria	Average Score
Control	Role-based access control	4.3
	Input validation	4.6
	Audit trail support	3.5
	<b>Total</b>	<b>12.4</b>
	<b>Average of questionnaires</b>	<b>12.4 ÷ 3 = 4.13</b>
	<b>Criteria</b>	<b>Satisfied</b>

Source: Data Processed 2025

The Control component scored an average of **4.13**, classified as **Satisfied** under the PIECES framework. This indicates that the system is seen as adequately supporting security, validation, and access control.

Input validation received the highest score (4.6), followed by role-based access (4.3), showing user confidence in managing access and ensuring data accuracy. The lower score for audit trail support (3.5) points to a need for further development in tracking user activity. Overall, the system fulfils key control requirements, though future enhancements in audit functionality are recommended to improve compliance and accountability.

Table 8. The Recapitulation of Satisfaction Level on Efficiency Variable

Indicator	Sub-Criteria	Average Score
Efficiency	Elimination of redundant tasks	4.8
	Workflow automation	4.9
	<b>Total</b>	<b>9.7</b>
	<b>Average of questionnaires</b>	<b>9.7 ÷ 2 = 4.85</b>
	<b>Criteria</b>	<b>Very Satisfied</b>

Source: Data Processed 2025

The Efficiency component scored an average of **4.85**, classified as **Very Satisfied** in the PIECES framework. This reflects strong user confidence in the system’s ability to streamline HR and payroll processes.

Workflow automation and redundancy elimination received high scores (4.9 and 4.8), indicating that the system effectively reduces repetitive tasks like

attendance tracking and payroll reporting. These results affirm that the design supports fast, accurate, and scalable operations, especially for SMEs aiming to enhance efficiency through digital transformation.

Table 9. The Recapitulation of Satisfaction Level on Service Variable

Indicator	Sub-Criteria	Average Score
Service	Interface simplicity	4.0
	Documentation and help support	3.5
	Visual accessibility	3.6
	<b>Total</b>	<b>11,1</b>
	<b>Average of questionnaires</b>	<b>11.1 ÷ 3 = 3.70</b>
	<b>Criteria</b>	<b>Satisfied</b>

Source: Data Processed 2025

The Service component received an average score of **3.70**, placing it in the Fairly **Satisfied** category under the PIECES framework. This indicates that while the system's usability is acceptable, several aspects still require enhancement.

Interface simplicity scored 4.0, suggesting ease of use, but lower scores in documentation support (3.5) and visual accessibility (3.6) point to gaps in user guidance and visual design. To improve adoption and user experience, future development should focus on strengthening help features, training materials, and interface refinement.

## DISCUSSION

The evaluation results of the proposed Human Resource Management (HRM) module using the PIECES framework and simulation-based estimation offer several important insights into its system quality and design feasibility. Overall, the average PIECES score of 4.36 suggests that the system is perceived as highly effective, especially in its core operational functions.

Table 10. PIECES Framework

Indicator	Average Score	Weighted Score
Performance	4,33	Very Satisfied
Information	4,23	Very Satisfied
Economy	4,95	Very Satisfied
Control	4,13	Satisfied
Efficiency	4,85	Very Satisfied
Service	3,70	Satisfied
<b>Average</b>	<b>4,36</b>	

Source: Data Processed 2025

The Economy and Efficiency components received the highest scores (4.95 and 4.85, respectively), demonstrating stakeholders' strong confidence in the system's ability to reduce manual effort, improve processing time, and streamline payroll and reporting tasks. These findings align with existing literature that emphasizes automation as a key driver of digital transformation in HR systems. (Li, 2021).

The Performance and Information dimensions also scored well (4.33 and 4.23), indicating that the system's design is expected to support reliable payroll automation, responsive interfaces, and compliance-ready data processing. This is especially relevant in the context of Indonesian SMEs, where manual systems are still prevalent, and regulatory compliance often poses a challenge (Merdin et al., 2023).

However, lower scores in Control (4.13) and Service (3.70) reveal areas requiring further development. While the system provides adequate input validation and access control, audit trail features are still conceptual. Similarly, limited user documentation and help functions may hinder user onboarding and satisfaction during implementation. These aspects are critical in ensuring long-term system adoption and governance, as noted by (Romney & Steinbart, 2017).

## **CONCLUSIONS AND RECOMMENDATIONS**

The design for the comprehensive HRM module in the MyERP Plus system has demonstrated good design feasibility, particularly in addressing the operational needs of Indonesian SMEs. Based on the PIECES framework evaluation, the system achieved an overall average score of 4.36, with the highest satisfaction in Economy and Efficiency, indicating good potential in reducing manual processes and improving process speed. Although Performance and Information also received high praise, the relatively lower scores for Control and Service reflect the areas needing further development for audit tracking and user support capabilities. It is therefore recommended that future developments prioritize the creation of audit trails, the design of comprehensive user guides, and testing through real-user testing and pilot implementation. These will help guarantee the system's usability, compliance, and performance over the long term in actual business environments.

## **FURTHER STUDY**

Although this research has demonstrated the feasibility of an integrated HRM module through design simulation and expert validation, it is limited by the absence of real-user deployment. Future research is encouraged to conduct empirical testing in operational environments to measure usability, performance, and user satisfaction under actual working conditions. In addition, further research may explore the integration of advanced features such as predictive HR analytics, mobile accessibility, or AI-based decision support to expand the system's strategic capabilities. Comparative research with other ERP-based HRM modules may also provide deeper insights into scalability and adaptability across various industries.

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