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ANALYSIS OF PAYROLL SYSTEM REQUIREMENTS BASED ON USER NEEDS FOR NON-CIVIL SERVANT EMPLOYEES AT UNIVERSITAS NEGERI SURABAYA

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Abstract

The digital transformation of financial governance in higher education has increased the demand for transparent, efficient, and accountable payroll management systems. However, payroll administration for non-civil servant employees at Universitas Negeri Surabaya is still primarily managed manually using spreadsheets, resulting in inefficiencies, fragmented data, delays, and a high risk of human error. This study aims to analyze the requirements for developing an Electronic Payroll Information System (SIGAJI) to support integrated payroll management. This research uses a descriptive qualitative approach with a system requirements analysis design. Data were collected through observation, documentation, and literature review involving payroll records, institutional regulations, and administrative workflows. Data analysis was conducted using qualitative descriptive techniques, including data reduction, categorization, and identification of system requirements. The results indicate that the current payroll system is not integrated and remains highly dependent on manual processing. The study identifies several functional requirements, including employee data management, payroll calculation, allowance and deduction processing, payroll reporting, payroll history, and digital payslips. Non-functional requirements include system security, usability, accessibility, integration capability, and operational efficiency. The findings also emphasize the importance of digital payroll governance aligned with institutional and national regulations. The study concludes that an integrated electronic payroll system is essential to improve efficiency, reduce errors, and strengthen transparency and accountability in payroll management. The findings provide a structured basis for the future development and implementation of the SIGAJI system in higher education financial governance.

Keywords: Electronic payroll; requirements analysis; higher education; information system; financial governance

Abstrak. Transformasi digital dalam tata kelola keuangan perguruan tinggi telah meningkatkan kebutuhan terhadap sistem manajemen penggajian yang transparan, efisien, dan akuntabel. Namun, administrasi penggajian pegawai non-aparatur sipil negara di Universitas Negeri Surabaya masih dikelola secara manual menggunakan lembar kerja spreadsheet, sehingga menyebabkan inefisiensi, fragmentasi data, keterlambatan proses, serta tingginya risiko kesalahan manusia. Penelitian ini bertujuan untuk menganalisis kebutuhan pengembangan Sistem Informasi Gaji Elektronik (SIGAJI) guna mendukung pengelolaan penggajian yang terintegrasi. Penelitian ini menggunakan pendekatan kualitatif deskriptif dengan desain analisis kebutuhan sistem. Data dikumpulkan melalui observasi, dokumentasi, dan kajian literatur yang melibatkan data penggajian, regulasi institusi, serta alur kerja administrasi. Analisis data dilakukan menggunakan teknik deskriptif kualitatif, meliputi reduksi data, kategorisasi, dan identifikasi kebutuhan sistem. Hasil penelitian menunjukkan bahwa sistem penggajian yang berjalan saat ini belum terintegrasi dan masih sangat bergantung pada proses manual. Penelitian ini mengidentifikasi beberapa kebutuhan fungsional, meliputi pengelolaan data pegawai, perhitungan gaji, pengolahan tunjangan dan potongan, pelaporan penggajian, riwayat penggajian, serta slip gaji digital. Adapun kebutuhan nonfungsional mencakup keamanan sistem, kemudahan penggunaan, aksesibilitas, kemampuan integrasi, dan efisiensi operasional. Temuan penelitian juga menekankan pentingnya tata kelola penggajian berbasis digital yang selaras dengan regulasi institusi dan kebijakan nasional. Penelitian ini menyimpulkan bahwa sistem penggajian elektronik yang terintegrasi sangat diperlukan untuk meningkatkan efisiensi, mengurangi kesalahan, serta memperkuat transparansi dan akuntabilitas dalam pengelolaan penggajian. Temuan penelitian ini memberikan landasan yang terstruktur bagi pengembangan dan implementasi sistem SIGAJI pada tata kelola keuangan perguruan tinggi di masa mendatang.

Kata kunci: penggajian elektronik; analisis kebutuhan; perguruan tinggi; sistem informasi; tata kelola keuangan.

Background

Financial management in higher education institutions in the era of digital transformation has shifted from merely fulfilling administrative obligations toward governance that emphasizes accountability, transparency, and data-driven decision making. Universities are increasingly required to strengthen institutional independence while improving financial reporting transparency to governments, students, and the public as part of good governance practices (Oglu, 2025; Dragan et al., 2025; Nurhayati et al., 2023). In response to these demands, recent studies highlight the adoption of Enterprise Resource Planning (ERP), Financial Management Information Systems (FMIS), and other digital financial platforms as key instruments for improving efficiency, cost control, and accountability in university financial management (Oglu, 2025; Singh et al., 2025; Nurhayati et al., 2023).

Recent literature also emphasizes that successful financial digitalization contributes to fiscal sustainability through improved budget efficiency and long-term financial stability (Palomas, 2025; Fauzi et al., 2025; Li et al., 2024). However, prior studies consistently show that digital transformation outcomes are strongly dependent on organizational readiness, including human resource competence, infrastructure availability, and data security systems (Oglu, 2025; Fauzi et al., 2025; Ho, 2021). This indicates that technology adoption alone is insufficient without system alignment with institutional processes and user needs.

In human resource and payroll management, integrated systems such as Human Capital Management Information Systems (HCMIS) and Integrated Personnel and Payroll Information Systems (IPPIIS) have been widely reported to enhance accountability, payroll control, and fraud prevention (Masele & Kagoma, 2021; Okechukwu et al., 2020; Yusuf et al., 2020). An effective payroll system is expected to ensure data integrity, auditability, and transparent access to financial information (Masele & Kagoma, 2021; Yusuf et al., 2020). Recent studies further confirm that electronic payroll systems improve calculation accuracy, reporting efficiency, and service transparency through automation, digital payslips, and integrated reporting features (Saputra et al., 2025; Lakshmirevathi et al., 2024; Nugraha et al., 2025; Nur et al., 2025; Praditha et al., 2024).

Despite these advancements, empirical evidence shows that many higher education institutions still rely on manual or spreadsheet-based payroll systems, which are prone to delays, calculation errors, data redundancy, and weak information security (Gomes et al., 2024; Nugraha et al., 2025; Murla et al., 2020). These limitations reduce administrative efficiency and may affect employee trust and institutional accountability. In addition, fragmented personnel data and non-integrated payroll procedures further increase the risk of inconsistencies and administrative inefficiencies (Gomes et al., 2024; Yusuf et al., 2020).

At Universitas Negeri Surabaya, payroll management for non-civil servant employees reflects similar challenges. Based on 2026 institutional data, there are 955 non-civil servant employees across various units, indicating a high level of payroll complexity. However, payroll processing is still conducted using spreadsheet-based systems and has not been integrated with personnel and financial information systems. The centralized payroll administration mechanism further contributes to longer processing time and increased administrative workload, limiting efficiency and real-time financial monitoring.

This condition reveals a clear gap between the ideal implementation of integrated, transparent, and auditable payroll systems recommended in recent literature and the actual practice of semi-manual payroll management in higher education institutions. While previous studies have extensively discussed the benefits and features of electronic payroll systems, there is still limited research focusing on structured requirements analysis tailored to institutional-specific contexts, particularly in Indonesian public universities with complex administrative structures.

Therefore, a system-level solution is required. Among several alternatives, the development of an integrated electronic payroll information system is considered the most sustainable approach to address inefficiencies, improve accuracy, and strengthen financial transparency. However, successful system development must begin with a structured

requirements analysis to ensure alignment with user needs, organizational policies, and operational conditions.

Based on this gap, this study aims to analyze the requirements of an electronic payroll information system for non-civil servant employees at Universitas Negeri Surabaya. The contribution of this research lies in providing a structured foundation of functional and non-functional requirements that can be used as a reference for the design and development of an integrated payroll system supporting digital financial governance in higher education institutions.

Method

This study employed a descriptive qualitative approach focusing on requirements analysis for the development of an Electronic Payroll Information System (SIGAJI) for non-civil servant employees at Universitas Negeri Surabaya. This approach was selected because the study aims to systematically describe and interpret existing payroll practices, identify system problems, and derive user and system requirements from real operational conditions rather than testing hypotheses or measuring variables numerically. Requirement analysis is a fundamental stage in information system development, as it ensures that system design aligns with organizational needs and operational context (Pressman & Maxim, 2020; Sommerville, 2016).

Research Design and Stages

The research followed a system development preliminary analysis framework consisting of five stages: (1) problem identification, (2) literature review, (3) data collection, (4) requirements analysis, and (5) reporting. This structure was used to ensure that the resulting requirements are grounded in both empirical conditions and established information system principles.

Research Site and Data Sources

The study was conducted at Universitas Negeri Surabaya, specifically within units responsible for payroll administration and financial management of non-civil servant employees. The data used were non-statistical operational data related to payroll processes. Data sources included payroll administration documents, payroll recapitulation reports, salary slips, employee personnel records, payroll workflow documentation, institutional regulations, and existing SIGAJI system documentation (if available). These sources were selected to ensure a comprehensive understanding of both administrative procedures and system constraints.

Participants and Informants

Although the study did not use a quantitative sampling approach, key informants were involved to support data triangulation. Informants were selected using purposive sampling,

consisting of payroll administrators, finance staff, and personnel officers directly involved in payroll processing. This selection was based on their direct involvement in payroll workflows and decision-making processes.

Data Collection Techniques

Data were collected using three techniques:

a. Observation

Direct observation was conducted on payroll administrative activities, including employee data entry, salary calculation, payroll verification, and reporting procedures. This was used to identify workflow patterns, delays, redundancies, and inefficiencies in the existing system.

b. Documentation Study

This involved collecting and reviewing payroll-related documents such as spreadsheets, payroll reports, salary slips, and administrative procedures. Documentation was used to map existing system structures and identify inconsistencies in data processing.

c. Literature Review

A literature review was conducted to strengthen the theoretical foundation of the study. Sources included scientific journal articles, books, institutional reports, and regulations related to payroll systems, human resource information systems, and digital financial governance. This helped align the identified requirements with established best practices.

Data Analysis Technique

The collected data were analyzed using qualitative descriptive analysis, following the interactive model of data reduction, data display, and conclusion drawing. The analysis process was carried out in the following steps:

- a. Data reduction, by selecting and focusing on relevant information related to payroll processes and system issues
- b. Data organization, by categorizing findings based on payroll workflow stages
- c. Requirement identification, by extracting system needs from observed problems and documentation
- d. Requirement classification, dividing them into:
 - 1) Functional requirements: employee data management, payroll calculation, payroll reporting, payroll history, and digital payslip services
 - 2) Non-functional requirements: system security, usability, accessibility, integration capability, and processing efficiency

- e. Conclusion drawing, by synthesizing the identified requirements into a structured specification for SIGAJI development

The resulting requirements analysis serves as the foundational input for future system design and development of an integrated electronic payroll information system at Universitas Negeri Surabaya.

Result and Discussion

Result

The analysis of the existing payroll management conditions at Universitas Negeri Surabaya indicated that the payroll administration process for non-civil servant employees had not yet been fully integrated into an electronic information system. The current payroll management process was still highly dependent on manual administration and spreadsheet-based data processing, particularly through the use of Microsoft Excel for payroll calculation, salary recapitulation, and payroll reporting activities. Although the existing approach had supported routine payroll administration, the increasing number of employees and the complexity of payroll components created significant operational challenges for payroll administrators. Previous studies have shown that manual and spreadsheet-based payroll systems are prone to inefficiency, data redundancy, and administrative complexity, particularly in institutions with large employee populations and diverse payroll structures (Gomes et al., 2024; Nugraha et al., 2025; Murla et al., 2020).

The findings revealed that payroll processing activities involved multiple administrative stages, including employee data verification, salary component calculation, allowance management, deduction processing, payroll validation, and payroll reporting. These processes were conducted separately and required repetitive manual input, increasing administrative workload and reducing operational efficiency. The use of spreadsheet-based processing also resulted in fragmented payroll data management because employee information, payroll calculations, and payroll reports were stored in different files and managed independently by each unit. Similar findings were identified by Yusuf et al. (2020), who stated that non-integrated payroll administration systems frequently create data inconsistencies and increase the complexity of payroll verification processes.

The analysis further showed that the current payroll management system frequently experienced delays in payroll processing and salary distribution. These delays were caused by the lengthy administrative verification process, manual data consolidation, and the absence of an integrated system capable of automatically synchronizing payroll and personnel data. As the number of non-civil servant employees increased across faculties and work units, payroll administrators faced difficulties in processing payroll data efficiently within the required

timeframe. Research conducted by Gomes et al. (2024) and Nugraha et al. (2025) also emphasized that manual payroll systems often contribute to delayed salary payments and administrative inefficiencies due to repetitive verification and data processing activities.

In addition, the existing payroll management process demonstrated a high risk of human error during payroll calculation and data input activities. Manual calculation of salary components, allowances, deductions, and payroll recapitulation increased the possibility of calculation inaccuracies, duplicate data entries, and inconsistencies in payroll records. The absence of an automated validation mechanism also complicated the process of detecting payroll discrepancies and correcting administrative errors. According to Murla et al. (2020), payroll systems that rely heavily on manual data processing are vulnerable to calculation errors and inconsistencies that may affect the accuracy and reliability of payroll information.

The analysis also identified the complexity of payroll management for non-civil servant employees as one of the major operational challenges faced by the university. Payroll administration involved diverse employment statuses, varying salary schemes, multiple allowance categories, tax deductions, and periodic payroll adjustments. These conditions required a payroll management system capable of processing complex payroll structures accurately and systematically. However, the current manual approach was considered insufficient to support the growing complexity of payroll administration within the university environment. Previous studies indicated that payroll systems in higher education institutions require integrated and automated mechanisms to manage complex payroll structures effectively and transparently (Lakshmirevathi et al., 2024; Ahmed et al., 2023).

Another significant issue identified in the analysis was the lack of integration between payroll administration and other institutional information systems, particularly personnel and financial management systems. Payroll data and employee data were managed separately, resulting in repetitive data entry processes and inconsistencies between administrative records. The absence of integrated data management also limited transparency, reduced reporting efficiency, and complicated payroll monitoring and audit processes. Studies by Rumetna et al. (2022) and Karimah et al. (2023) highlighted that integrated payroll information systems are necessary to improve organizational data synchronization, strengthen financial accountability, and support effective payroll auditing processes.

Based on the payroll cycle concept proposed by George H. Romney and Paul John Steinbart (2005), payroll management consists of interconnected processes involving attendance recording, payroll transaction processing, journal recording, ledger posting, and financial reporting activities. The payroll cycle also includes data input, data storage, data processing, report generation, and internal control mechanisms that support organizational accountability and financial governance.

Payroll accounting information systems are designed to provide financial information required by management while simultaneously serving as a form of accountability to external stakeholders, such as investors, creditors, and tax authorities. Therefore, payroll systems should not only support payroll calculation activities but also ensure the accuracy, transparency, and reliability of payroll information processing. In the context of Universitas Negeri Surabaya, the existing payroll management approach had not fully accommodated integrated payroll cycle activities because payroll administration processes were still conducted partially and manually across different administrative units. Consequently, the implementation of an integrated electronic payroll information system became increasingly necessary to support more efficient payroll administration, strengthen financial control mechanisms, and improve institutional accountability.

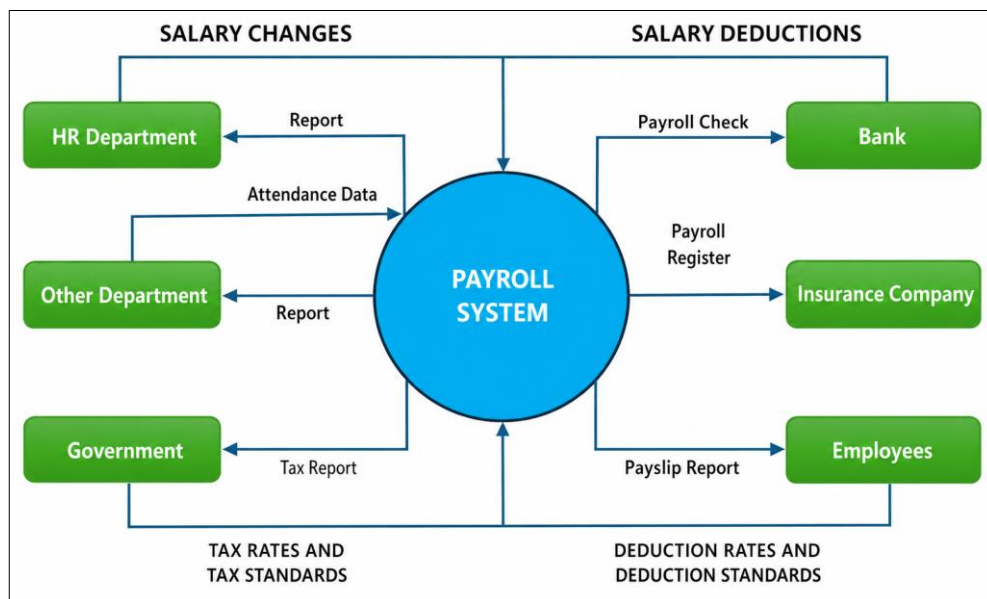


Figure 1. Payroll Cycle (Source: Romney & Steinbart, 2005, Accounting Information Systems)

Table 1. Existing Payroll Management System Conditions

Aspect	Current Condition	Impact
System type	Spreadsheet-based (Excel)	Low automation
Data management	Separate files per unit	Data fragmentation
Processing	Manual multi-stage workflow	Delayed processing
Calculation	Manual salary computation	High error risk
Integration	Not integrated with HR/finance	Data duplication
Reporting	Manual reporting	Limited transparency

The findings show that payroll administration for non-civil servant employees at Universitas Negeri Surabaya is still dominated by manual and spreadsheet-based processing,

particularly using Microsoft Excel. While this approach supports basic operational needs, it is increasingly inadequate due to the growing number of employees and payroll complexity.

From an information systems perspective, this condition reflects a low level of system maturity, where data is still processed in isolated files rather than integrated databases. This is consistent with Gomes et al. (2024) and Nugraha et al. (2025), who found that spreadsheet-dependent payroll systems tend to generate inefficiencies, duplication of work, and administrative delays in large organizations.

The payroll process involves multiple stages such as verification, calculation, validation, and reporting, but these stages are conducted manually and independently. According to Yusuf et al. (2020), non-integrated payroll systems create **data silos**, which reduce accuracy and increase verification complexity. This condition is evident at UNESA, where payroll data must be repeatedly re-entered across different administrative files.

A critical issue identified is delayed payroll processing caused by manual consolidation and verification. From a process efficiency theory perspective, this reflects high transaction cost and low process automation. Gomes et al. (2024) confirm that manual payroll workflows significantly increase processing time in institutions with large employee populations.

Another key finding is the high risk of human error, particularly in salary calculations and data entry. This aligns with Murla et al. (2020), who emphasize that manual payroll systems lack validation mechanisms, increasing the likelihood of financial discrepancies. At UNESA, the absence of automated checks makes error detection reactive rather than preventive.

Table 2. Identified Payroll Cycle Gaps Based on Romney & Steinbart Model

Payroll Cycle Stage	Ideal Condition (Theory)	Actual Condition at UNESA
Data input	Integrated employee database	Manual input across files
Processing	Automated payroll system	Spreadsheet-based calculation
Storage	Centralized database	Dispersed file storage
Reporting	Real-time reporting system	Manual report generation
Control	Automated audit trail	Limited traceability

Based on Romney & Steinbart’s (2005) payroll cycle model, payroll systems should operate in an integrated flow consisting of data input, processing, storage, reporting, and control. However, the findings show that UNESA’s payroll system only partially supports this cycle. The absence of integration breaks the continuity of the payroll cycle, particularly in data storage and reporting stages.

This gap indicates that the institution has not fully implemented the principles of an Accounting Information System (AIS), where integration and internal control are essential components. Consequently, payroll transparency and auditability remain limited.

Previous studies (Saputra et al., 2025; Praditha et al., 2024) confirm that electronic payroll systems significantly improve accuracy, efficiency, and transparency through automation and centralized data management. This reinforces the urgency of transitioning from manual to integrated systems.

The development of the Electronic Payroll Information System (SIGAJI) for non-civil servant employees at Universitas Negeri Surabaya was based on the results of organizational and regulatory requirements analysis related to payroll management, financial governance, and administrative digitalization. The analysis indicated that payroll management at the university could no longer rely entirely on manual or spreadsheet-based processes due to the increasing complexity of employee data, salary components, deductions, and financial reporting requirements. These conditions demonstrated the need for an integrated electronic payroll system capable of supporting accurate, transparent, and accountable payroll management.

The analysis of regulatory requirements showed that the development of SIGAJI needed to align with national policies regarding administrative digitalization and electronic financial governance. Circular Letter of the Secretary General of the Ministry of Education and Culture Number 15/M/2020 concerning administrative digitalization emphasized the implementation of electronic-based administrative services, including financial management systems within educational institutions. Based on this regulation, the payroll system was required to support integrated data management, automated payroll processing, and electronic documentation processes.

At the institutional level, the analysis also identified the necessity of aligning the proposed system with internal university regulations related to human resource and payroll management. The Rector Decree Number 31 of 2022 concerning Human Resource Management and Rector Regulation Number 33 of 2025 concerning Permanent Employee Salaries at Universitas Negeri Surabaya PTNBH indicated that payroll administration should be conducted in a structured, transparent, and accountable manner. Therefore, the proposed SIGAJI system was required to accommodate payroll procedures, employee classifications, salary components, and reporting mechanisms in accordance with institutional policies.

The organizational analysis further revealed that the status of Universitas Negeri Surabaya as a State University with Legal Entity (PTNBH) increased the complexity of financial and personnel management. This condition created the need for a modern and integrated payroll system capable of connecting personnel data, salary components, deductions, and payroll reporting processes within a unified system. The integration requirement became increasingly important to support efficient payroll administration and improve the quality of financial governance within the university environment.

The requirements analysis also identified the need for the system to fulfill technical, operational, and usability aspects. From the operational perspective, the system was expected to simplify payroll processing activities, reduce administrative workload, and accelerate payroll reporting procedures. From the technical perspective, the system needed to provide data security, accessibility, and integration capabilities with other institutional systems. In addition, usability requirements indicated that the system should be practical, user-friendly, and capable of facilitating payroll administration activities for both administrators and employees.

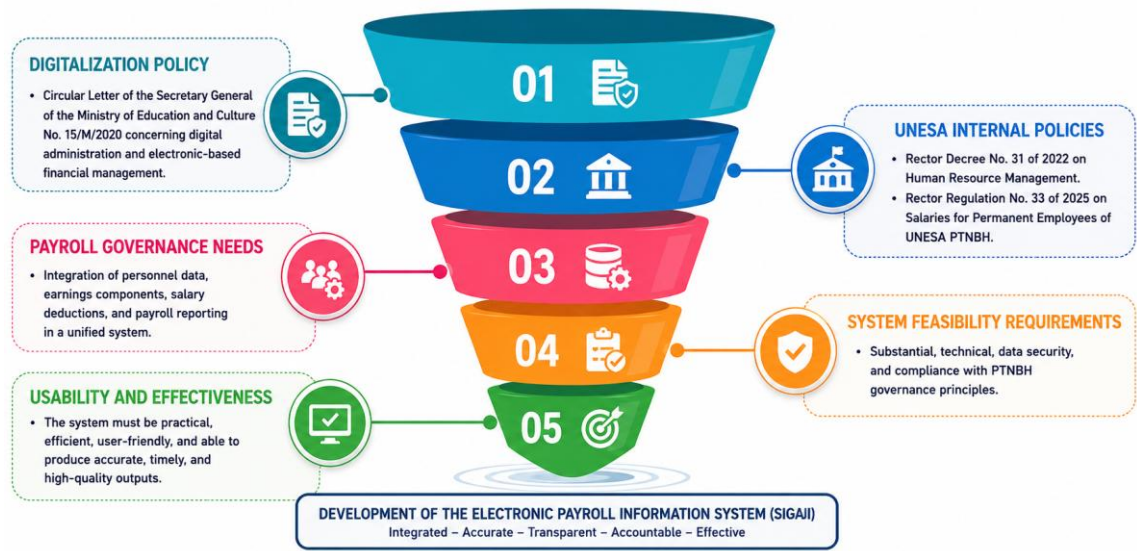


Figure 2. Organizational and Regulatory Requirements Framework for SIGAJI Development

Figure 1 illustrates the relationship between regulatory policies, institutional governance requirements, system feasibility considerations, and usability requirements that form the basis for the development of the SIGAJI system at Universitas Negeri Surabaya. The framework demonstrates that the proposed system is not only designed to support payroll administration processes but also to strengthen accountability, transparency, and integrated financial governance within the university environment.

Table 3. Regulatory and Organizational Requirements for SIGAJI

Requirement Level	Key Regulation/Condition	System Implication
National policy	Digital administration regulation (SE No. 15/M/2020)	Must support electronic governance
Institutional policy	Rector Decree No. 31/2022	Must follow HR governance structure
Salary regulation	Rector Regulation No. 33/2025	Must support structured salary components
Organizational status	PTNBH governance model	Requires integrated financial control

The analysis shows that SIGAJI development is not only a technical requirement but also a regulatory necessity. National policies on digital administration require public institutions to adopt electronic-based systems, including financial management. This aligns with Oglu (2025), who states that digital governance policies are key drivers of institutional system transformation.

At the institutional level, UNESA’s PTNBH status increases governance complexity, requiring higher accountability and financial autonomy. According to institutional theory, organizations under higher autonomy require stronger internal control systems to maintain transparency and compliance.

However, the current payroll system does not fully reflect these regulatory demands. This creates a misalignment between policy expectations and operational reality, which is a key research gap identified in this study.

Table 4. Gap Between Regulatory Expectations and Existing System

Dimension	Expected Condition	Existing Condition
Transparency	Fully auditable payroll system	Limited traceability
Integration	HR–finance system integration	Separate systems
Automation	Digital payroll processing	Manual processing
Compliance	Regulation-aligned system	Partially compliant

This gap indicates that compliance is currently more procedural than system-based. In other words, regulations exist, but system infrastructure does not yet fully support them. From a socio-technical systems perspective, this suggests a lack of alignment between technology, organization, and policy, which is essential for successful digital transformation (Fauzi et al., 2025).

The scope of this SIGAJI (Payroll Information System) Application User Manual covers the procedures for using the SIGAJI application by Personnel Expenditure Administration Officers (PPABP) and Financial Administrators within Universitas Negeri Surabaya. This manual was prepared as a guideline to support the implementation of payroll processes that are orderly, accurate, accountable, and compliant with applicable regulations.

SIGAJI (Payroll Information System) is an integrated application developed by Universitas Negeri Surabaya to support the management of payroll administration for non-civil servant employees in an orderly, transparent, and accountable manner. The application was designed as the primary system for payroll processing, accommodating employee data management, salary and allowance calculation, deduction management, payroll recording, and payroll reporting in accordance with applicable laws and institutional regulations.

The SIGAJI application is utilized by organizational units within UNESA with role and access distributions adjusted according to the responsibilities of each user. For Personnel

Expenditure Administration Officers (PPABP) and Financial Administrators, SIGAJI functions as the primary tool for salary calculation and payment processes, as well as for preparing and monitoring payroll reports systematically, accurately, and in an integrated manner.

Discussion

The findings indicate a consistent pattern across three main dimensions, namely operational inefficiency caused by manual payroll processes, structural fragmentation resulting from the lack of system integration, and a governance gap between regulatory expectations and the actual capability of the existing system. These conditions show that payroll administration at Universitas Negeri Surabaya has not yet fully transitioned into an integrated digital system, particularly in handling non-civil servant employee data and payroll processes.

This situation is in line with the findings of Lakshmirevathi et al. (2024) and Ahmed et al. (2023), who emphasize that payroll systems in higher education institutions require strong integration between human resource and financial modules to ensure accuracy, efficiency, and accountability. Their studies highlight that system fragmentation and manual processing remain major obstacles in achieving reliable payroll governance, which is also evident in this study.

From a theoretical perspective, these findings support the Accounting Information System (AIS) framework, particularly the principles of integration, internal control, and reliable reporting. The absence of a fully integrated system at UNESA indicates that these AIS principles have not been optimally implemented in the current payroll process. Practically, the results suggest that the existing system is still in a semi-digital stage, where digital tools are used but without full system integration or automation across processes.

The main contribution of this study lies in formulating detailed functional and non-functional system requirements that are directly derived from real organizational conditions and operational constraints. These requirements provide a structured foundation for the development of the SIGAJI system and can serve as a reference for designing an integrated payroll information system that is more efficient, transparent, and aligned with institutional governance needs.

The findings of this study indicate that the existing payroll management system for non-civil servant employees at Universitas Negeri Surabaya has not yet fully supported integrated and digital-based payroll administration. The payroll process is still highly dependent on manual administration and spreadsheet-based data processing, resulting in administrative inefficiencies, delays in payroll processing, and a high risk of calculation errors. These findings are consistent with previous studies stating that manual payroll systems tend to create operational inefficiencies, repetitive administrative work, and vulnerabilities to human error,

particularly in institutions with large numbers of employees and complex payroll structures (Gomes et al., 2024; Murla et al., 2020; Nugraha et al., 2025).

The study also revealed that payroll administration activities at the university involve multiple processes, including employee data verification, payroll calculation, allowance management, deduction processing, payroll recapitulation, and payroll reporting. However, these activities are still managed separately and are not fully integrated into a centralized information system. As a result, payroll administrators are required to perform repetitive data input and manual verification activities, increasing administrative workload and reducing operational efficiency. This finding supports Yusuf et al. (2020), who emphasized that fragmented payroll administration systems frequently create data inconsistencies and complicate payroll verification and monitoring processes.

Another important finding identified in this study concerns the risk of delays in payroll processing and salary distribution. The absence of automated data synchronization between payroll administration and personnel management systems contributes to lengthy verification processes and inefficient payroll recapitulation procedures. Similar findings were reported by Gomes et al. (2024), who stated that manual payroll systems commonly experience delays due to repetitive administrative activities and the absence of integrated payroll processing mechanisms.

The findings further demonstrated that manual payroll management practices increase the potential for human error during salary calculation and data entry activities. Errors related to payroll calculations, deductions, allowances, and payroll recapitulation may affect the accuracy and reliability of payroll information. According to Murla et al. (2020), payroll systems that rely heavily on manual processing are highly vulnerable to calculation inaccuracies and administrative inconsistencies. Therefore, the implementation of automated payroll calculation and validation mechanisms becomes increasingly important to improve payroll accuracy and reduce operational risks.

This study also identified that payroll management complexity at Universitas Negeri Surabaya continues to increase due to the diversity of employment statuses, salary schemes, allowance categories, tax deductions, and periodic payroll adjustments for non-civil servant employees. These conditions require an integrated payroll information system capable of processing complex payroll structures systematically and accurately. Previous studies have similarly shown that higher education institutions require integrated payroll systems to support complex payroll administration and ensure transparent financial governance (Lakshmirevathi et al., 2024; Ahmed et al., 2023).

In addition, the findings highlighted the absence of integration between payroll administration and other institutional information systems, particularly personnel and financial

management systems. Payroll and personnel data are currently managed separately, resulting in repetitive data entry processes and inconsistencies between administrative records. This condition limits organizational transparency and complicates payroll monitoring and auditing activities. Rumetna et al. (2022) and Karimah et al. (2023) emphasized that integrated payroll information systems are essential for improving data synchronization, strengthening accountability, and supporting effective organizational financial control.

The findings of this study also align with the payroll cycle concept proposed by George H. Romney and Paul John Steinbart (2005), which explains that payroll management consists of interconnected activities involving attendance recording, payroll transaction processing, journal recording, ledger posting, and financial reporting. Payroll accounting information systems are designed not only to support payroll calculation activities but also to ensure organizational accountability through accurate financial reporting and effective internal control mechanisms. Therefore, the current payroll management approach at Universitas Negeri Surabaya has not yet fully accommodated integrated payroll cycle activities because payroll administration processes are still conducted manually and separately across organizational units.

Furthermore, the findings indicate that the development of an integrated electronic payroll information system is necessary to support institutional financial governance and administrative digitalization within the university environment. The implementation of SIGAJI is expected to improve payroll administration efficiency, reduce human error, strengthen transparency, and support integrated payroll reporting processes. These findings are in line with previous studies demonstrating that electronic payroll systems significantly improve operational efficiency, payroll accuracy, transparency, and organizational accountability (Saputra et al., 2025; Praditha et al., 2024; Bracho-Fuenmayor et al., 2025).

Overall, the results of this study demonstrate that the development of SIGAJI is not merely a technological initiative but also a strategic effort to strengthen digital governance, improve payroll administration quality, and support accountable financial management at Universitas Negeri Surabaya.

Conclusion

This study examined the requirements for developing the Electronic Payroll Information System (SIGAJI) for non-civil servant employees at Universitas Negeri Surabaya. The main finding indicates that the current payroll management process is still characterized by limited system integration and reliance on manual, spreadsheet-based procedures. This condition shows that payroll administration has not yet fully transitioned into a digital, integrated, and automated system, which affects efficiency, accuracy, and consistency in payroll governance.

From a broader perspective, the study demonstrates that payroll processes within the institution involve multiple interrelated activities that are still executed in a fragmented manner.

This fragmentation creates inefficiencies and highlights the need for a unified system that can support end-to-end payroll management. In addition, the analysis of organizational and regulatory context confirms that digital transformation in payroll administration is not only a technical necessity but also a compliance requirement aligned with national policies and institutional governance standards under the PTNBH framework.

The main contribution of this study lies in producing a structured set of functional and non-functional requirements for an electronic payroll information system that is grounded in real operational conditions and institutional constraints. These requirements provide a practical foundation for system development and help bridge the gap between digital governance expectations and actual payroll practices in higher education institutions.

Practically, the findings emphasize the need for an integrated payroll system to improve administrative efficiency, reduce errors, and strengthen transparency and accountability in financial management. This study is limited to the requirements analysis stage; therefore, future research is needed to advance system design, implementation, and evaluation to ensure the effectiveness and sustainability of the proposed SIGAJI system in supporting payroll operations.

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