

# Designing Payroll Accounting Information Systems to Enhance Internal Control in Hotels in Sentani, Jayapura, Papua

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## Abstract.

This study critically examines the role of payroll accounting information systems as a pivotal internal control mechanism within the hospitality industry. Employing a qualitative case study methodology, the research integrates both primary and secondary data sources collected through comprehensive fieldwork, including semi-structured interviews and rigorous document analysis. The investigation uncovers systemic inefficiencies, including the absence of a dedicated finance department, incomplete payroll documentation, and overlapping responsibilities between accounting and payroll staff, collectively undermining payroll accuracy and employee trust. Findings reveal that these structural deficiencies heighten the risk of errors and reduce operational transparency. The study advocates for strategic organizational reforms, including the establishment of an autonomous finance department, clear segregation of payroll and accounting functions, and the implementation of comprehensive payroll documentation—such as detailed employee bank account records, payroll summaries, pay slips, and cash disbursement vouchers. These interventions are projected to substantially enhance the reliability and effectiveness of internal controls in payroll management, thereby mitigating financial risks and fostering greater employee confidence. This research contributes to the broader discourse on leveraging integrated accounting information systems to strengthen internal control frameworks and optimize operational performance in service-sector organizations. The insights offer valuable implications for practitioners and researchers seeking to strengthen internal governance by enhancing technological and procedural aspects of accounting information systems.

**Keywords:** Accounting Information System, Internal Control, Organizational Efficiency, Payroll System.

## 1. Introduction

In today's increasingly complex and competitive business environment, operational efficiency and financial integrity are fundamental pillars for organizational sustainability. The Payroll Accounting Information System plays a critical role in corporate management, serving not only as a mechanism for employee compensation but also as a key instrument in strengthening internal control (Astuti & Wicaksono, 2021; Panjaitan et al., 2023). An effective payroll system is designed to ensure accurate calculations, prevent fraud, minimize errors, and ensure compliance with applicable regulations (Rara Prastiwi et al., 2023.).

Literature reviews indicate that payroll systems reliant on manual processes are frequently vulnerable to issues such as miscalculations, delayed payments, and reporting difficulties (Panjaitan et al., 2023; Astuti & Wicaksono, 2021). Such limitations can erode employee trust, reduce operational efficiency, and lead to financial losses due to fraud risk

(Astuti & Wicaksono, 2021). In response to these challenges (Astuti & Wicaksono, 2021), many organizations have adopted web-based Payroll Accounting Information Systems developed with programming frameworks such as PHP, Laravel, or CodeIgniter. These systems have proven capable of enhancing data accuracy, operational efficiency, and data accessibility, allowing employees to independently print their pay slips (Handayani et al., 2023; Yusman et al., 2023; Irawan & Tasdik, 2024).

Previous studies have explored the implementation of Payroll Accounting Information Systems across diverse sectors, including manufacturing, plantation, education, and government institutions. These studies emphasize the significance of task segregation, proper authorization, and adequate documentation in payroll systems to reinforce internal controls ((Astuti & Wicaksono, 2021); (Mutia et al., 2024)). Additionally, some research highlights the integration of Payroll Accounting Information Systems with other systems, such as Human Resource Management and Cash Management, to optimize performance ((Nurul Yaqin & Yunia, 2023).; (Liputo et al., 2024)). However, challenges persist in several organizations, such as manual attendance recording, technological infrastructure constraints, and the need for refining operational procedures (Mutia et al., 2024; Liputo et al., 2024)

Although various studies have examined the design and analysis of Payroll Accounting Information Systems across different sectors and geographic contexts, a significant research gap remains in comprehensive investigations of system implementation and design in the hospitality industry in Sentani, Jayapura, Papua. Most existing research addresses manufacturing, general service, or governmental sectors but lacks a focused analysis of challenges and solutions tailored to the unique socio-economic and geographic characteristics of Sentani's hospitality sector. The lack of thorough studies linking the design of Payroll Accounting Information Systems to enhanced internal control in this hospitality context represents a critical gap to be addressed.

This research is driven by the recognition of the importance of effective Payroll Accounting Information Systems and robust internal control. Given Sentani's significant tourism growth potential, an efficient and reliable management system is essential. Therefore, this study aims to design a Payroll Accounting Information System to improve internal control within hotels in Sentani, Jayapura, Papua. Through a systematic approach, this study will analyze needs, identify system weaknesses, and propose a robust system design. The expected outcomes are contributions to both academic knowledge and practical improvements in internal control effectiveness, operational efficiency, and the sustainable management of the hospitality business in the region.

## 2. Literature Review

### 2.1 Payroll Accounting Information System (Payroll AIS)

The Payroll Accounting Information System (Payroll AIS) is a subsystem of the Accounting Information System designed to manage the entire employee payroll cycle, encompassing the collection of attendance data, calculation of basic salary, allowances, deductions, salary disbursement, and reporting. This definition aligns with the perspective that the system includes a series of interconnected procedures, documents, and tools for processing payroll information Mulyadi (2016) as cited in Astuti & Wicaksono (2021). The primary functions of Payroll AIS include collecting work-hour data, calculating net salaries, processing

deductions (taxes, social security, loans), processing salary payments, and generating accurate reports for management (Romney & Steinbart, 2018, as cited in Astuti & Wicaksono, 2021).

Advancements in information technology have significantly transformed the implementation of Payroll AIS. Manual systems, prone to errors, inaccuracies, and delays, are increasingly being replaced by computerized or web-based systems. Research articles have demonstrated that web-based systems developed using programming frameworks such as PHP, Laravel, or CodeIgniter enhance efficiency, data accuracy, and information accessibility (Handayani et al., 2023; Yusman et al., 2023; Irawan & Tasdik, 2024). For example, the development of a web-based payroll system for teachers at SMKTIK Yadika Cicalengka successfully reduced processing time and minimized errors associated with spreadsheet use (Yusman et al., 2023). Similarly, the web-based payroll system at the Regional Secretariat of Tasikmalaya Regency was designed to improve efficiency and accuracy through integrated features for employee data management, attendance tracking, and reporting (Irawan & Tasdik, 2024).

## 2.2 Internal Control in Payroll Systems

Internal control is a crucial element in ensuring the integrity and reliability of the Payroll Accounting Information System. According to the COSO framework (Committee of Sponsoring Organizations of the Treadway Commission), internal control is a process designed to provide reasonable assurance regarding the achievement of organizational objectives, including operational effectiveness and efficiency, reliable financial reporting, and compliance with applicable laws and regulations (COSO, 2013 as cited in Astuti & Wicaksono, 2021).

Within the payroll context, effective internal control aims to prevent and detect fraud, errors, and misuse of company assets. Key components of sound internal control in payroll systems include:

1. Segregation of Duties: Ensuring that no individual or small group has control over the entire payroll cycle. For instance, those authorized to approve attendance data should be different from those who process salary payments.
2. Authorization: Every payroll transaction must be authorized by responsible parties, from approval of overtime to final approval of salary disbursement.
3. Documentation and Record-Keeping: Utilizing adequate documentation and maintaining accurate records for all payroll transactions, including pay slips, payroll registers, and payment vouchers.
4. Verification and Reconciliation: Verifying input data (e.g., attendance) and reconciling payroll data with other financial records.

Research by Astuti and Wicaksono (2021) shows that internal control positively influences the effectiveness of accounting information systems. Weaknesses in internal control, such as inadequate authorization or inaccurate record-keeping, increase the risk of fraud and errors (Astuti & Wicaksono, 2021; Mutia et al., 2024). A study at PT. Pertamina Training & Consulting found that although the payroll system functions well, some theoretical principles were not fully applied, indicating a need for internal control adaptations tailored to specific operational contexts (Pristiwantiyasih & Suhartono, 2024). Likewise, analysis at PTPN II Sei Semayang revealed weaknesses in monitoring overtime hours, which could lead to potential fraud, despite the system being adequate for internal management purposes (Mutia et al., 2024).

## 2.3 Previous Research on Payroll AIS and Internal Control

Various studies have examined the relationship between Payroll Accounting Information Systems and the effectiveness of internal control in organizations. Rara Prastiwi et al. (2023) found that payroll systems and internal control jointly have a significant positive effect on the effectiveness of accounting information systems, highlighting their complementary roles in establishing reliable accounting systems.

Some studies focus on the design and implementation of payroll systems. For example, the development of a web-based payroll system incorporating a Cash Management System (CMS) at CV. XYZ Jember showed that CMS facilitates efficient salary distribution through real-time transactions and flexible authorization, although challenges remain in manual attendance administration (Liputo et al., 2024). Studies on payroll effectiveness at PT. Pertamina Training & Consulting MOR V concluded that although the system operates fairly well, some theoretical principles are only partially applied, indicating a need to adjust operational procedures (Pristiwantiyasih & Suhartono, 2024).

Furthermore, research on the influence of human resource management on Payroll AIS, mediated by financial management practices, confirms the significant roles of both departments in system production and management, underscoring the importance of cross-functional integration (Pristiwantiyasih & Suhartono, 2024)

Despite valuable insights from existing literature on Payroll AIS design, analysis, and internal control roles across sectors, a significant research gap persists. Most studies emphasize manufacturing, general service, or government sectors, with limited focused investigation into the specific challenges and solutions for Payroll AIS design to strengthen internal control in the hospitality industry in Sentani, Jayapura, Papua. The unique characteristics of the hospitality sector, such as fluctuating work demands, diverse job positions, and operational flexibility, require tailored approaches. Therefore, this study aims to address this gap by designing a Payroll Accounting Information System specifically for hotels in Sentani, with a focus on reinforcing internal controls.

## 3. Method

This study employs a qualitative research approach with a case study design. The qualitative approach is chosen to gain an in-depth understanding of the design of the Payroll Accounting Information System and its impact on internal control within the specific context of hotels in Sentani, Jayapura, Papua. The case study method facilitates the exploration of complex phenomena in real-world settings, providing a holistic overview of the processes and challenges encountered (Yin, 2018).

### 3.1 Research Approach

A descriptive qualitative method is utilized to comprehensively describe the current conditions of the Payroll Accounting Information System in the selected hotels, identify system weaknesses, and formulate design recommendations. This approach allows researchers to delve into qualitative aspects such as stakeholder perceptions, operational challenges, and the functional requirements of the system

### 3.2 Research Location and Subjects

The research is conducted at a hotel in the Sentani area of Jayapura, Papua, which was selected due to the study's geographical focus. The subjects include hotel management, finance or accounting department staff, and employees directly involved in payroll processing.

### 3.3 Data Collection Techniques

Data are gathered through several primary techniques:

1. In-depth Interviews: Conducted with key informants such as managers and finance staff to understand existing payroll workflows, documentation, roles and responsibilities, and perceptions of system effectiveness and internal control.
2. Direct Observation: Involves firsthand observation of ongoing payroll processes, system usage (when applicable), and the working environment to obtain contextual understanding.
3. Document Analysis: Examination of relevant documents such as payroll Standard Operating Procedures (SOPs), payroll lists, pay slips, attendance forms, related financial reports, and system manuals (if available) to validate data obtained from interviews and observations.

### 3.4 Data Analysis.

Data from interviews, observations, and document studies will be analyzed using thematic and content analysis methods. The analysis process comprises:

1. Data Reduction: Selecting, focusing, simplifying, abstracting, and transforming raw data.
2. Data Presentation: Organizing data into structured formats such as comparative matrices, descriptive narratives, or process flow diagrams.
3. Conclusion Drawing and Verification: Interpreting presented data to conclude on current system effectiveness, internal control weaknesses, and design requirements for a new system. These conclusions are verified through data triangulation from multiple sources

### 3.5 Validation and Verification

The system design results will be validated and verified via:

1. Expert Review: Soliciting feedback from practitioners or academics specializing in accounting information systems and internal control.

User Feedback: Engaging prospective system users from hotel staff to review designs and prototypes, ensuring the system meets their functional needs

## 4. Result and Discussion

### 4.1 Existing Conditions and Internal Control Weaknesses

An analysis of hotels in Sentani reveals that payroll systems predominantly remain manual or semi-computerized, relying heavily on spreadsheets. This aligns with findings in the

literature indicating vulnerabilities of manual systems to errors and inaccuracies (Panjaitan et al., 2023; Astuti & Wicaksono, 2021). The most prominent internal control weaknesses identified include:

1. **Predominance of Manual Processes:** Dependence on spreadsheets and manual recording increases the risk of input errors and data manipulation.
2. **Inadequate Segregation of Duties:** Frequently, a single individual manages multiple stages of the payroll cycle, undermining internal oversight effectiveness.
3. **Weak Authorization:** Approval procedures for overtime, salary deductions, or final payroll authorization often lack formal structure or are carried out by unauthorized personnel.
4. **Technological Constraints:** Infrastructure and budget limitations impede the adoption of more advanced information systems, contrasting with the potential benefits offered by web-based solutions (Handayani et al., 2023).

Collectively, these weaknesses foster an environment where the risks of fraud and payroll processing errors are elevated, while operational efficiency is hindered.

#### **4.2 Proposed Enhanced Payroll Accounting Information System Design**

To address these identified weaknesses, an integrated web-based Payroll Accounting Information System model has been designed. The design focuses on process automation and strengthening internal controls.

Key System Features:

1. **Integrated Attendance Management:** Replacing manual attendance recording with more accurate solutions, such as fingerprint or mobile applications.
2. **Automated Payroll Calculation:** Minimizing errors by automating calculations of salaries, allowances, and deductions based on validated data.
3. **Digital Authorization Workflows:** Ensuring that all critical transactions (overtime, deductions, final approvals) undergo formal, digitally recorded authorization processes.
4. **Audit Trails:** Recording all system activities for traceability and accountability.

Internal Control Strengthening in Design:

1. **Segregation of Duties through User Access Levels:** The system is structured with access tiers separating input, processing, authorization, and reporting functions.
2. **Data Validation:** Equipped with automatic validation mechanisms to reduce input errors.
3. **Detailed Reporting:** Generating comprehensive electronic pay slips and accurate reports for transparency and compliance.

A detailed visualization of the proposed payroll process is presented in the attached Payroll Flowchart (Figure 1).

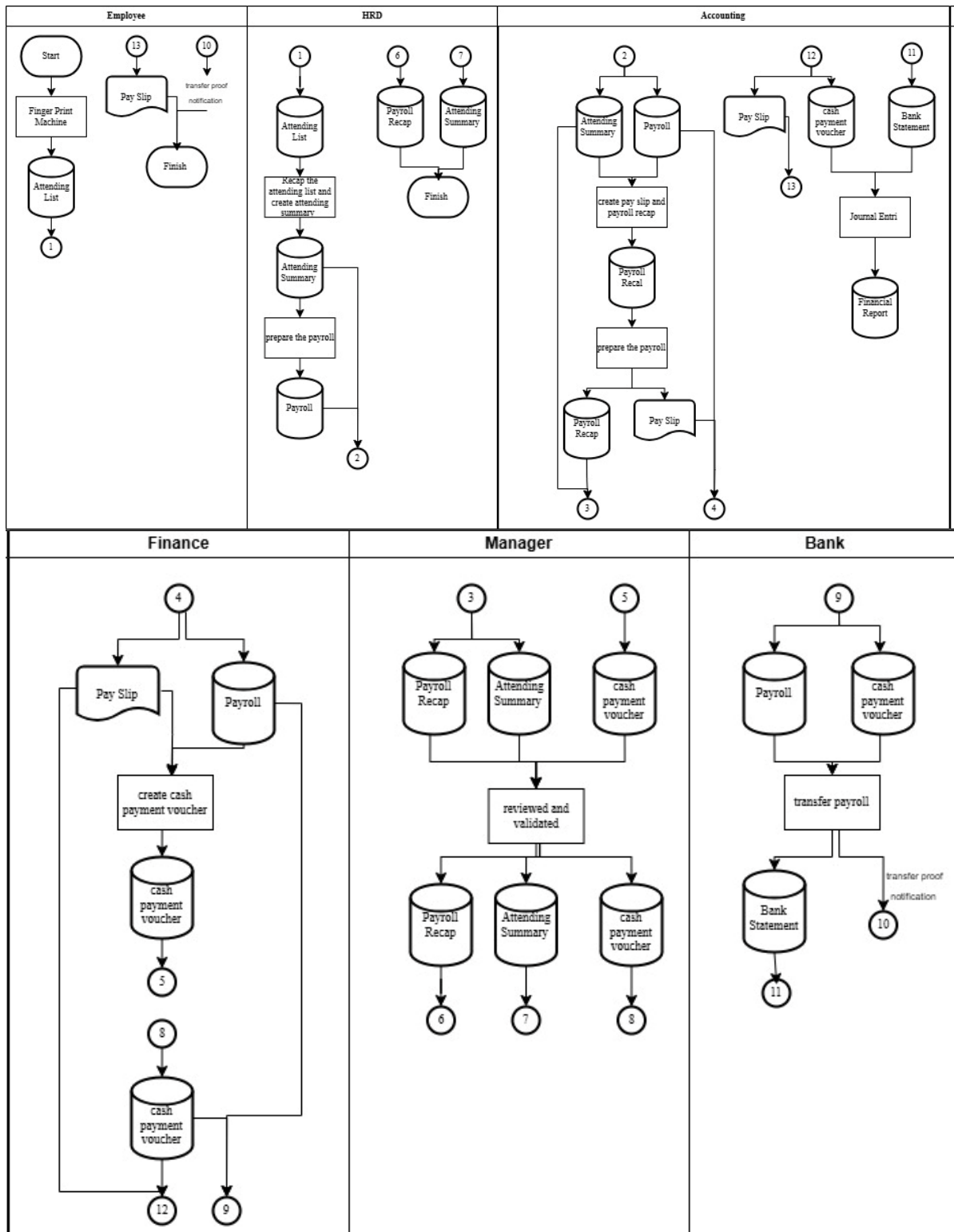


Figure 1. Proposed Payroll Flowchart

### 4.3 Implications and Discussion

The system design is expected to yield significant positive impacts, including:

1. Improved Accuracy and Efficiency: Automation reduces manual errors and accelerates payroll cycles.
2. Strengthened Internal Control: Implementation of digital authorization features, audit trails, and structured segregation of duties enhances accountability and mitigates misuse risks.
3. Enhanced Compliance: Assists hotels in adhering to payroll-related regulations.

This design adapts best practices from prior studies ((Yusman et al., 2023).; (Liputo et al., 2024).; (Irawan & Tasdik, 2024).) to tackle the specific challenges of the hospitality industry in Sentani, which often faces technological and resource limitations. Emphasis on user-friendly design and adaptability to varied connectivity conditions is critical.

This research contributes by offering a Payroll Accounting Information System design model tailored to the hospitality context in Sentani, Jayapura, Papua, that integrates robust internal controls. It fills an existing research gap concerning the application of payroll AIS in the hospitality sector within a unique geographical area with distinct operational challenges.

## 5. Conclusion

This study successfully designed a Payroll Accounting Information System to enhance internal control in hotels in Sentani, Jayapura, Papua. Analysis of existing conditions revealed that the majority of hotels in the region still operate payroll systems manually or semi-computerized, making them vulnerable to errors, inaccuracies, and internal control weaknesses, including inadequate segregation of duties, weak authorization processes, and a lack of standardized documentation.

Key findings include the identification of specific shortcomings in the payroll processes of hotels in Sentani, including:

1. Dominance of Manual Processes: Reliance on spreadsheets and manual record-keeping increases the risk of data input errors and manipulation.
2. Weak Segregation of Duties: The same employees often handle multiple stages of the payroll cycle, reducing the effectiveness of internal oversight.
3. Informal Authorization: Absence of formal and documented authorization procedures for payroll approvals, overtime, and deductions.
4. Technological Limitations: Infrastructure and budget constraints hinder the adoption of more sophisticated information systems.

In response, this study proposes the design of an integrated web-based Payroll Accounting Information System. The design emphasizes process automation, reinforced segregation of duties through user access levels, implementation of digital workflows for authorization, and creation of audit trails to enhance accountability and transparency. The system is tailored to address the identified weaknesses, thereby improving accuracy and efficiency and, most importantly, strengthening internal control over payroll operations in Sentani hotels.

Overall, the research underscores that designing a Payroll Accounting Information System aligned with operational needs and supported by robust internal control principles is

critical to improving financial integrity and management effectiveness in the hospitality industry, particularly in regions facing unique operational and technological challenges.

Based on the research findings and conclusions, the following recommendations are proposed:

1. For Hotel Management in Sentani:
  - a. Implementation of the Proposed System: Hotel management should consider adopting or developing computerized payroll systems as per the proposed design. This implementation should be accompanied by adequate training for relevant staff to ensure optimal understanding and use of the system.
  - b. Strengthening Internal Controls: Even if full system implementation is not immediately feasible, hotels are advised to progressively apply fundamental internal control principles such as segregation of duties, formalizing authorization, and documenting payroll procedures.
  - c. Periodic Evaluation: Regularly assess the effectiveness of existing payroll systems and internal controls to identify areas for improvement in line with evolving business and technological contexts.
2. For Future Research:
  - a. System Implementation and Evaluation: Future studies could focus on implementing the proposed prototype or system in a hotel within Sentani and empirically evaluating its effectiveness.
  - b. Comparative Studies: Conduct comparative analyses between hotels employing computerized payroll systems and those using manual processes to quantitatively assess impacts on efficiency and error rates.
  - c. Cybersecurity Aspects: Given the web-based nature of the system, future research can explore cybersecurity measures to safeguard sensitive employee data against cyber threats.
  - d. Cost-Benefit Analysis: Detailed cost-benefit studies to assist hotel management in making investment decisions related to payroll systems.

Research in Other Geographical Contexts: Adapt and test the proposed system design in hospitality industries in other areas of Papua or similarly remote regions with comparable characteristics.

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