


Design and Development of an Employee Database and Daily Reporting Information System Using Rapid Application Development (RAD)

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Article Info	Abstract
<p>Article history: Received: 2 April 2026 Revised: 1 June 2026 Accepted: 3 June 2026</p> <hr/> <p>Keyword: Daily reporting Employee database Information system Rapid application development Web</p>	<p><i>Employee data management and daily operational reporting play an important role in supporting efficiency, accuracy, and decision-making processes in warehouse operations. However, many organizations still rely on spreadsheet-based reporting systems and manual data recording processes that are vulnerable to data redundancy, inconsistent updates, limited monitoring capabilities, and delays in report recapitulation, which negatively affect operational efficiency and information accuracy. Previous studies have generally focused only on employee administration systems or inventory management separately, while limited research has discussed the integration of employee databases, daily activity reporting, and operational monitoring within a unified information system. This study aims to design and develop an integrated employee database and daily reporting information system to improve operational efficiency and reporting accuracy in warehouse activities. The system integrates employee data management, daily activity recording, automated reporting, and role-based access control within a centralized platform. The Rapid Application Development (RAD) method was applied to support iterative development and faster adaptation to user requirements. System evaluation was conducted using Black Box Testing to verify functional reliability and system performance. The results show that the proposed system successfully reduces data duplication, accelerates report generation processes, improves information accessibility, and enhances operational transparency and managerial decision-making. The implementation results also demonstrate that the developed system provides a more structured, efficient, and integrated approach to warehouse personnel administration and daily operational reporting.</i></p>
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1. Introduction

The rapid advancement of information technology has significantly transformed operational management practices across various industrial sectors, particularly in logistics and warehouse operations. Information systems are increasingly utilized to improve data accuracy, operational transparency, and decision-making efficiency[1]. In warehouse environments, employee data management and daily operational reporting are critical components that support monitoring activities, workforce coordination, and reporting processes[2]. However, many organizations still rely on manual or spreadsheet-based reporting mechanisms that are vulnerable to data redundancy, inconsistent updates, reporting delays, and limited real-time monitoring capabilities[3]. These limitations negatively affect operational efficiency and reduce the accuracy of managerial decision-making processes. At PT Pertamina Drilling Services Indonesia (PDSI), warehouse personnel activities and employee reporting processes are still partially managed using physical documents and shared spreadsheets such as Google Sheets[4]. This condition frequently causes data duplication, input inconsistencies, difficulties in report recapitulation, and data collisions when

multiple users access the same document simultaneously[5]. Furthermore, the absence of an integrated reporting system limits information accessibility and slows operational coordination between warehouse personnel and management.

Several previous studies have discussed the implementation of information systems to improve administrative and operational activities[6]. Palupiningtyas et al. developed a knowledge management system using the Rapid Application Development (RAD) approach to improve employee performance and organizational knowledge management. Oktavian et al. implemented a reporting information system for vehicles and heavy equipment using the RAD method to accelerate reporting processes and improve data management. Meanwhile, Leonardo and Wiratama designed a web-based inventory and sales information system to improve operational efficiency through integrated reporting features[7]. Although these studies demonstrate that information systems can enhance organizational performance, most previous research focuses separately on employee administration, inventory systems, or reporting modules. Limited studies specifically discuss the integration of employee databases, daily operational reporting, and real-time warehouse activity monitoring within a unified information system[8]. In addition, existing studies generally focus on system implementation without emphasizing operational coordination problems caused by spreadsheet-based reporting mechanisms in warehouse environments[9]. Therefore, a research gap still exists regarding the development of an integrated personnel reporting information system capable of supporting centralized data management, operational monitoring, and automated reporting simultaneously[10].

Based on these problems and research gaps, this study proposes the development of an integrated employee database and daily reporting information system for warehouse operational activities[11]. The proposed system is designed to centralize employee data management, facilitate daily activity reporting, automate report generation, and provide role-based access control to improve information security and operational transparency[12]. Unlike previous systems that relied on separated reporting mechanisms, the proposed solution integrates personnel administration and operational reporting into a single platform to reduce data redundancy and improve reporting efficiency[13]. The Rapid Application Development (RAD) method was applied in this research to support iterative system development and enable faster adaptation to user operational requirements[14]. Through the implementation of this system, warehouse operational processes are expected to become more structured, efficient, accurate, and responsive to managerial information needs[15].

2. Research Methodology

The development of this employee database and daily reporting system follows the Rapid Application Development (RAD) method[16]. This approach is chosen for its efficiency in building high-quality systems through iterative prototyping and active user involvement[17]. The methodology consists of three main phases: Requirements Planning, RAD Design Workshop, and Implementation[18].

2.1 RAD Design Workshop

The research was conducted through a structured workflow based on the Rapid Application Development (RAD) framework to ensure speed and alignment with user needs[19]. The stages are illustrated in Figure 1 and described as follows:

1. Planning Phase: This initial stage involved defining the research objectives and identifying the scope of the personnel database system at PT PDSI. A literature review was conducted to establish a theoretical foundation for warehouse management and web-based reporting systems[20].
2. Analysis Phase: In this stage, a thorough analysis of the existing manual reporting process (Google Sheets) was performed to identify pain points, such as data redundancy and lack of real-time synchronization[20]. Functional and non-functional requirements were gathered through interviews with logistics personnel.
3. Design Phase: The system architecture was designed using Unified Modeling Language (UML), including Use Case and Entity Relationship Diagrams (ERD). This phase focused on creating a professional and responsive User Interface (UI) that facilitates efficient data entry.
4. Implementation and Testing: The system was developed using PHP and MySQL[21]. Following development, the system underwent Black Box Testing to ensure all features functioned correctly and fulfilled the requirements identified in the analysis phase[22].

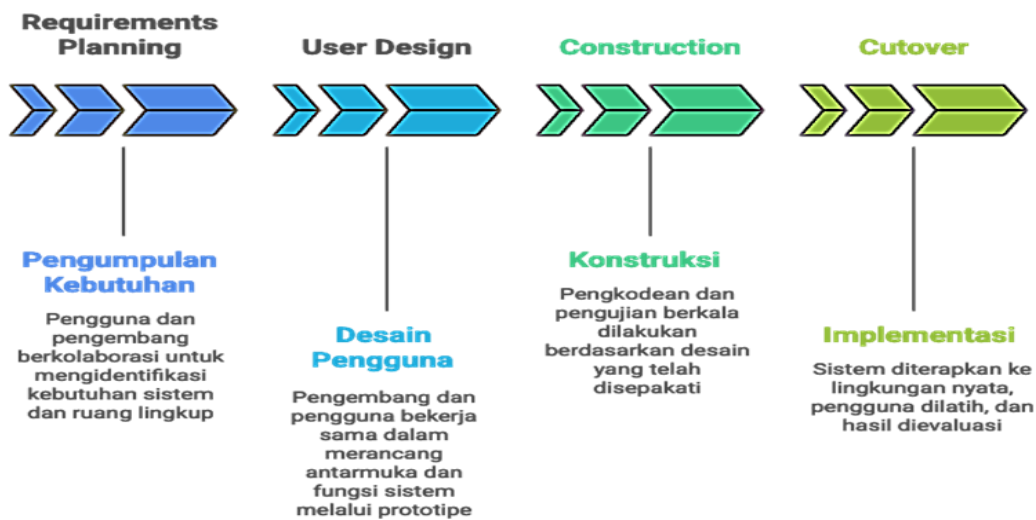


Figure 1. RAD Life Cycle for Warehouse Reporting System

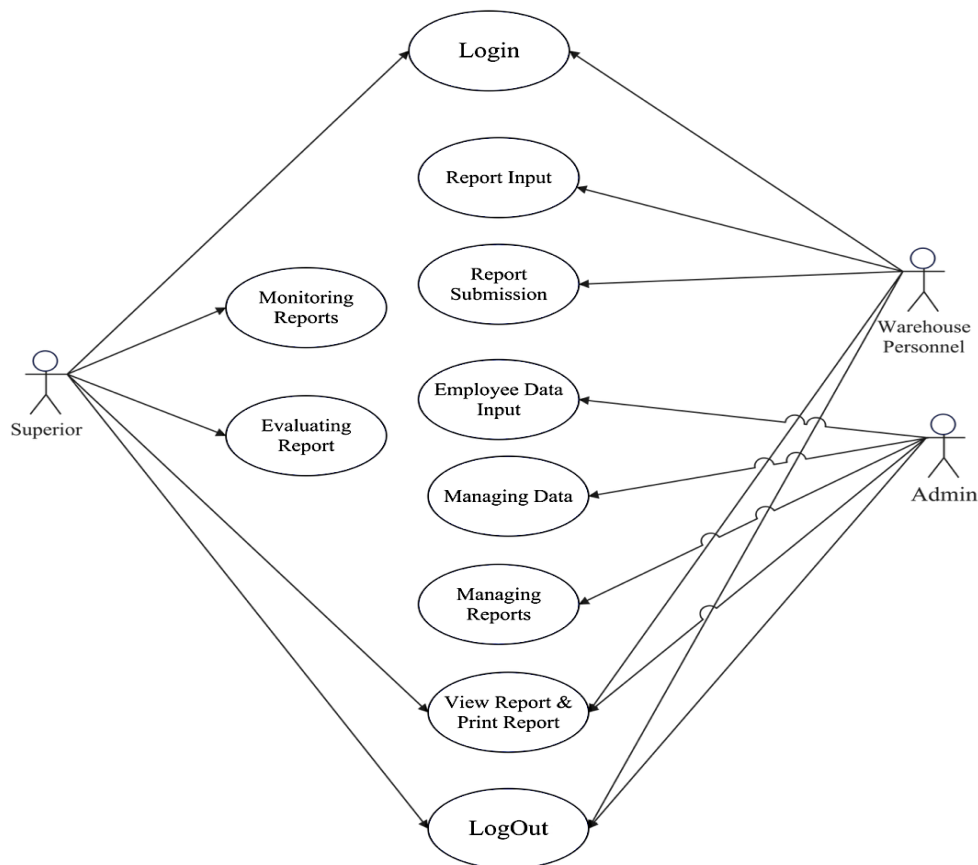


Figure 2. Use Case Diagram of the Personnel Database and Reporting System

2.2 System Architecture and Use Case Design

The interaction between users and the proposed web-based system is modeled using a Use Case Diagram[23], as shown in Figure 2. The system architecture defines three distinct user roles with specific access privileges to ensure data security and operational efficiency at the PT PDSI warehouse.

Explanation of Figure 2:

1. Admin: The Admin holds the highest level of authority. Their primary responsibilities include managing the employee master database (CRUD operations), managing user accounts, and monitoring all daily reporting activities. The Admin ensures that the core data used by the system is accurate and up-to-date.

2. User (Storekeeper/Personnel): This role is focused on operational data entry. Users are authorized to log into the system to input their daily activities, update personal profile information, and view their individual performance history. This decentralized input method eliminates the data collisions previously experienced with shared spreadsheets.
3. Manager (Supervisor): The Manager role serves an oversight function. While they do not engage in daily data entry, they have access to the dashboard to monitor real-time warehouse activities and generate comprehensive daily or monthly reports. This feature provides the management with a reliable basis for swift decision-making.

2.3 Database Design (Entity Relationship Diagram)

The system's data architecture is structured using an Entity Relationship Diagram (ERD) to ensure data integrity and efficient retrieval[24]. The database consists of several interconnected tables, primarily focusing on the relationship between employee identities and their daily operational logs. The complete relational model is illustrated in Figure 3. Explanation of Figure 3 as follows:

1. Central Entities: The `tb_karyawan` table serves as the master data source, containing unique identifiers for each warehouse personnel. It is linked to the `tb_laporan` table through a One-to-Many relationship, where one employee record can be associated with multiple daily activity logs over time.
2. Relational Integrity: To maintain consistency, the `tb_laporan` table uses foreign keys that reference the employee ID. This structure ensures that every activity report is accurately traced back to the specific individual, eliminating the risk of data redundancy or manual input errors commonly found in spreadsheet-based systems.
3. Authentication and Access Control: The `tb_users` table manages system security by storing credentials and role-based access levels. By separating user account data from employee personal data, the system provides an additional layer of security, ensuring that only authorized personnel can modify sensitive information or generate managerial reports.

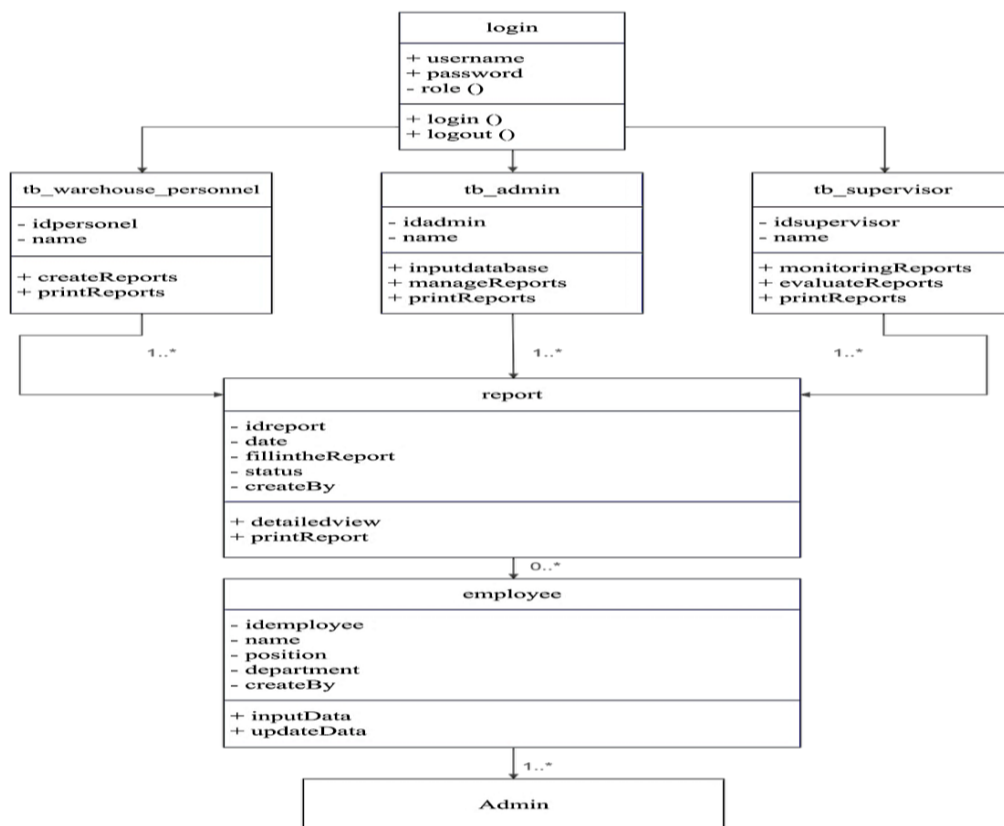


Figure 3. Entity Relationship Diagram (ERD) of the System

2.4 Problem Analysis and System Performance Measurement.

The problem analysis was conducted to identify operational constraints in the existing warehouse personnel reporting business process at PT Pertamina Drilling Services Indonesia (PDSI). The analysis focused on employee data management, daily activity reporting workflows, report recapitulation, and information accessibility during warehouse operations. Based on observations and interviews with warehouse personnel and logistics coordinators, the existing process still relied on shared spreadsheets and manual documentation, resulting in several operational issues.

The primary problems identified include data redundancy caused by repeated manual input, inconsistent reporting formats between users, difficulties in tracking employee activity histories, and delays in report recapitulation due to non-centralized data storage. In addition, simultaneous access to shared spreadsheet documents frequently caused data collisions and synchronization issues, reducing data accuracy and operational efficiency. The absence of role-based access control also increased the risk of unauthorized data modification and limited the effectiveness of managerial monitoring processes.

Based on these identified problems, the proposed system was designed to provide centralized employee data management, integrated daily activity reporting, automated report generation, and role-based access control within a unified platform. The problem analysis results became the basis for determining system requirements, designing system architecture, defining user roles, and constructing the database structure used in this research.

To evaluate system performance, several indicators were used during implementation and testing. Functional performance was measured using the Black Box Testing method to ensure that all system features operated according to user requirements. Operational efficiency was evaluated by comparing the duration of report recapitulation processes before and after system implementation. The previous manual process required approximately 60–120 minutes for report compilation, while the developed system reduced the process to less than 5 minutes through automated reporting features. In addition, system performance evaluation also considered data accessibility, reporting accuracy, and the effectiveness of role-based access management in supporting warehouse operational activities.

3. Results and Discussions

This section presents the implementation results and operational performance analysis of the proposed employee database and daily reporting information system. The discussion focuses on how the developed system addresses the operational problems identified during the analysis phase, including data redundancy, reporting delays, limited monitoring capabilities, and information accessibility within warehouse activities at PT PDSI. In addition, this section evaluates the effectiveness of the implemented functional features in improving reporting efficiency, operational transparency, and managerial decision-making processes.

3.1. Functional Feature Impelmentation

The developed employee database and daily reporting information system was successfully implemented to support warehouse operational activities. The system consists of several functional modules designed to address the operational problems identified during the analysis phase, including data duplication, reporting delays, limited monitoring capability, and lack of centralized data accessibility.

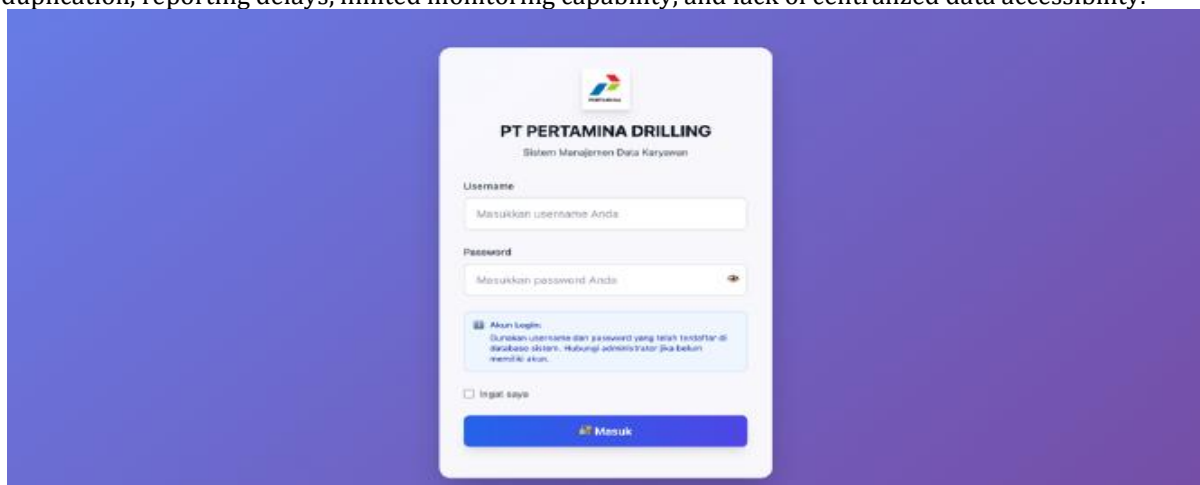


Figure 4. Login Interface and Role-Based Access Authentication.

3.1.1 Authentication and Role-Based Access Control

The first implemented feature is the authentication and role-based access control module. The system requires users to authenticate through the login interface before accessing operational functions. In Figure 4, the login mechanism validates user credentials against the system database and redirects users according to their assigned access levels, namely administrator, warehouse personnel, and manager. This feature improves system security by preventing unauthorized access to operational and personnel information. Compared to the previous spreadsheet-based mechanism, access control significantly strengthens accountability and minimizes the risk of uncontrolled data modification.

3.1.2 Employee Database Management Module.

In Figures 5a and 5b, the employee database management feature enables administrators to perform Create, Read, Update, and Delete (CRUD) operations for personnel records within a centralized database environment.

Input Data Karyawan

Petunjuk Input Data Karyawan (Terintegrasi dengan Tally):

- Form ini terintegrasi langsung dengan database sistem
- Isi form input data karyawan dengan lengkap dan akurat
- Pastikan Nopek (Nomor Pekerja) unik dan tidak duplikat
- Semua field yang wajib diisi harus difungsikan
- Data akan tersimpan otomatis ke spreadsheet setelah submit berhasil
- Setelah input, klik tombol "Refresh Data" untuk melihat data terbaru
- Data akan muncul di tabel dan dashboard setelah refresh

Form Input Data Karyawan Online
 Terintegrasi dengan Tally | Auto-sync ke Database | Refresh Form | Refresh Data

Input Data Karyawan

Nopek, Nama Lengkap, Jabatan, Email, Tempat Kerja, Departemen, Tempat Lahir, Tanggal Lahir, Umur Sekarang, No. Handphone, Jenis kelamin, Status, Alamat

Submit →

(a)

DATA KARYAWAN - SUPPLY CHAIN MANAGEMENT

Pencarian Cepat: Cari nama, jabatan, departemen...
 Filter Departemen: Semua Departemen
 Filter Jabatan: Semua Jabatan
 Tampilkan: 10 data

Refresh Data | Reset Filter | Data Spreadsheet

Menampilkan 1 - 10 dari 11 data

Nopek	Nama Lengkap	Jabatan	Tempat Kerja	Departemen	Tempat Lahir	Tanggal Lahir	Umur	Jenis Kelamin	Alamat	No. HP	Email	Status
245426	Febri Pratama	Logistic Coordinator	Kantor PDSI	Logistic	Prabumulih	-	34	Laki-Laki	Kota Prabumulih	82122726304	mik.febri.pratama@pertamina.com	Aktif
231222	Surtio Arwansah	Material Man	PDSI #01.2/N808-M	Logistic	Prabumulih	-	44	Laki-Laki	Kota Prabumulih	628786765855	Surtioarwansah@pertamina.com	Aktif
113244	Wisnu Nugraha	Store keeper	PDSI #01.2/N808-M	Logistic	Prabumulih	-	40	Laki-Laki	Kota Prabumulih	628783421835	Wisyunugraha@pertamina.com	Aktif
232312	Bambang Siswoyo	Store keeper	PDSI #01.2/N808-M	Logistic	Lahat	-	38	Laki-Laki	Kota Lahat	628213423335	Bambangsiswoyo@pertamina.com	Aktif
443322	Tukiyat	Material Man	PDSI #05.2/QW760-M	Logistic	Palembang	-	47	Laki-Laki	Kota Palembang	628213424343	Tukiyat@pertamina.com	Aktif

(b)

Figure 5. Employee Database Management Interface; (a) Entry interface; (b) View data

Through this module, as shown in Figures 5a and 5b above, employee identities, departments, and operational information are consistently stored within a relational database system. The system automatically validates required input fields before saving records into the database. This feature addresses previous operational issues related to duplicate employee records, inconsistent spreadsheet formats, and fragmented personnel information management.

3.1.3 Daily Activity Reporting Module.

The daily activity reporting feature was implemented to facilitate operational reporting by warehouse personnel through structured digital reporting forms.

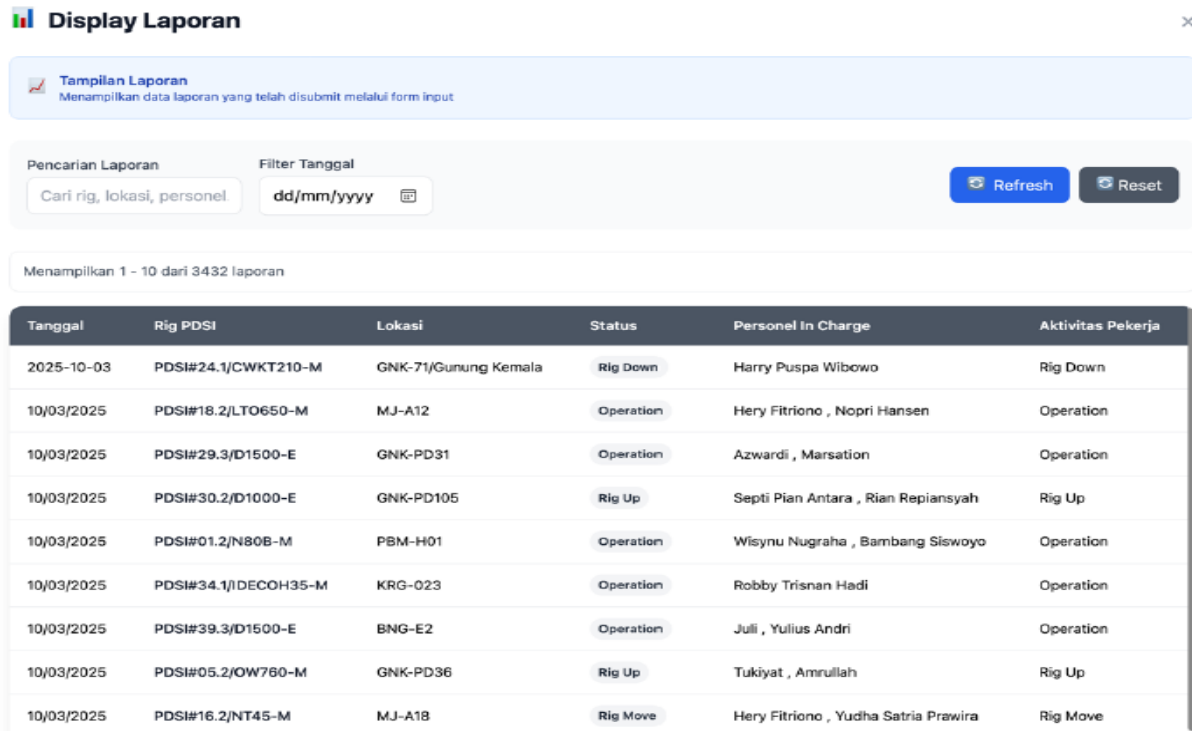


Figure 6. Daily Operational Activity Reporting Interface.

In Figure 6 above, users can record operational activities directly through the system interface. Each submitted report is automatically associated with employee identity information and reporting timestamps. Compared to manual spreadsheet-based reporting, this mechanism significantly improves report traceability, data consistency, and reporting accessibility. The system also eliminates spreadsheet collision issues that previously occurred during simultaneous multi-user access.

3.1.4 Dashboard and Operational Monitoring Feature.

The system provides an integrated monitoring dashboard to support real-time operational supervision and centralized information access.

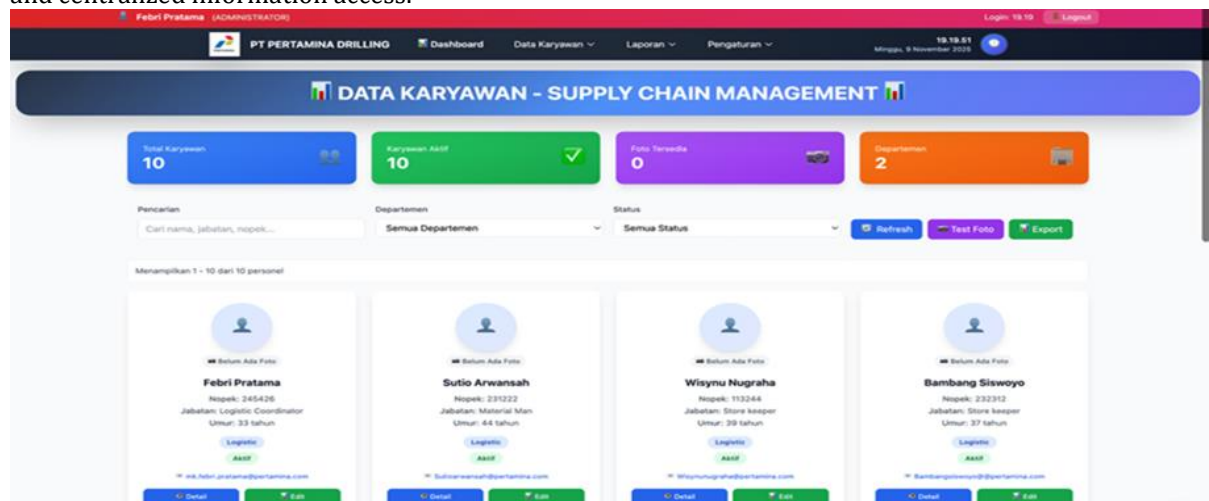


Figure 7. Integrated Dashboard for Operational Monitoring and Reporting.

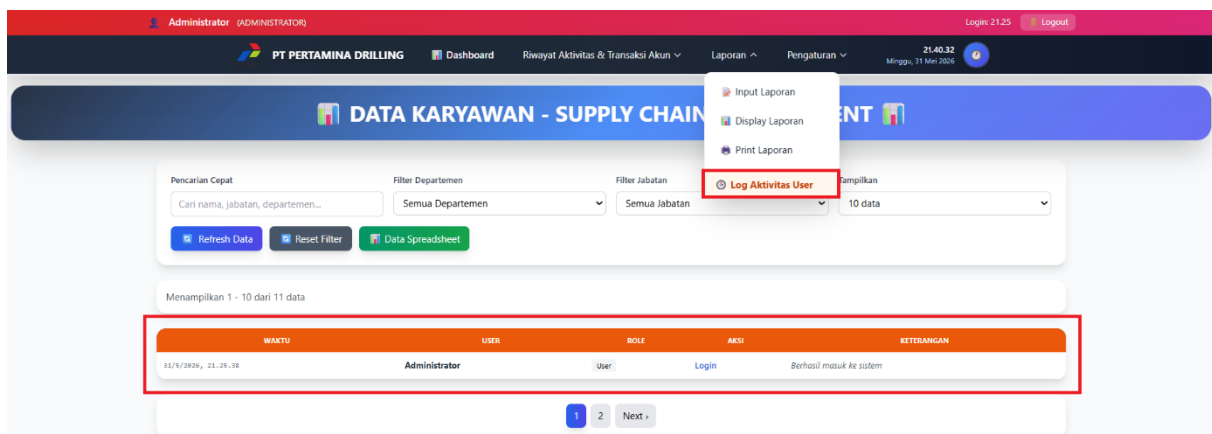


Figure 8. User Activity Monitoring and Audit Trail Interface.

In Figure 7, The dashboard displays operational summaries, employee status, reporting activity, and warehouse information within a single interface. Managers and supervisors can directly monitor warehouse operational conditions without depending on manual report submissions. This feature improves operational transparency, accelerates information retrieval, and supports faster managerial decision-making processes.

3.1.5 User Activity Log and Audit Trail.

An additional functional module implemented in the system is the user activity logging feature. In Figure 8, This module records operational activities performed by users, including login activity, report submission, and data modification history. The implementation of an audit trail mechanism strengthens operational accountability and enables administrators to monitor system usage more effectively.

3.2. Operational Performance Analysis

In Table 1 below, System performance evaluation was conducted by comparing operational conditions before and after system implementation. The evaluation focused on reporting efficiency, data accessibility, monitoring capability, synchronization, and operational security.

The results demonstrate that the proposed system substantially improves operational performance. The implementation reduced report recapitulation duration from approximately 60–120 minutes to less than 5 minutes through automated reporting functionality. The centralized database architecture also minimized duplicate records and improved data synchronization compared to separate spreadsheet-based reporting files. Furthermore, the implementation of dashboard monitoring enabled real-time information access, while role-based access control improved operational security and reduced unauthorized modification risks. These findings indicate that the developed system not only functions technically but also provides measurable operational improvements in warehouse reporting and personnel information management.

3.3 Discussions

The findings of this study demonstrate that the implementation of an integrated employee database and daily reporting information system significantly improves warehouse operational management processes. Based on the functional implementation results, the system successfully addresses several operational problems identified during the analysis phase, including data duplication, reporting delays, fragmented information accessibility, and limited monitoring capability.

Table 1. Operational Performance Comparison Before and After System Implementation

No	Operational Indicator	Previous Manual System	Proposed Information System
1	Report Recapitulation Time	60 – 120 Minuter	Less than 5 Minutes
2	Data Storage	Separate Spreadsheets	Centralized database
3	Data Duplication Risk	High	Very Low
4	Reporting Accessibility	Limited	Real-time access
5	Monitoring Process	Manual Checking	Automated dashboard
6	Data Synchronization	Often inconsistent	Integrated and synchronized
7	Access Control	Not available	Role-based access

The implementation of the employee database module and centralized reporting mechanism improved data consistency and operational traceability. Unlike the previous spreadsheet-based workflow, the developed system enables structured employee data management, integrated daily activity recording, and synchronized information storage within a centralized relational database. This implementation substantially reduced duplicate records and minimized inconsistencies caused by simultaneous multi-user access. The operational performance evaluation also demonstrated measurable improvements after system implementation. Report recapitulation time decreased from approximately 60–120 minutes to less than 5 minutes, indicating significant gains in reporting efficiency. In addition, the integrated dashboard and role-based access control improved real-time monitoring capability, information accessibility, operational transparency, and managerial decision-making responsiveness.

Compared to previous studies that primarily focused on administrative systems, inventory systems, or standalone reporting modules, this research provides a broader contribution by integrating employee database management, operational reporting, monitoring capability, and access control within a unified platform. The findings support previous research regarding the positive impact of integrated information systems on organizational efficiency while extending the discussion toward warehouse operational environments that heavily depend on collaborative reporting workflows.

Several limitations were also identified during system implementation. Some users initially experienced adaptation challenges when transitioning from manual reporting practices to system-based workflows, requiring user training and iterative interface improvements. Furthermore, the current system is still limited to internal warehouse operations and has not yet been integrated with enterprise resource planning (ERP) platforms, mobile notification services, or advanced usability evaluation frameworks. Therefore, future studies are recommended to explore system scalability, enterprise platform integration, mobile-based operational monitoring, and more comprehensive evaluation methods such as usability testing, user satisfaction analysis, and long-term operational impact assessment.

4. Conclusion

This research successfully implemented a web-based employee database and daily reporting information system for warehouse personnel at PT Pertamina Drilling Services Indonesia (PDSI) by applying the Rapid Application Development (RAD) method, which proved effective in aligning operational requirements with rapid system development. Through the integration of a MySQL relational database, this system comprehensively resolved data duplication and data collision issues previously encountered with conventional spreadsheets. Empirically, Black Box testing results demonstrated a 100% functional success rate, where reporting automation significantly reduced data recapitulation time from 60-120 minutes to less than 5 minutes, thereby substantially enhancing information accuracy and management efficiency. While the primary objectives have been achieved, future developments are recommended to integrate this system with the corporate ERP and incorporate real-time notification features to optimize a more modern and secure warehouse administration workflow.

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