

Case Study

Information System for Monitoring Follow-up on Audit Results as an Effort to Digitize the Audit Process at the National Civil Service Agency

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Abstract

The follow-up process of examination results at the National Civil Service Agency (BKN) has so far been conducted manually using spreadsheets and physical documents, which has the potential to cause delays in reporting, data duplication, and low monitoring efficiency. This research aims to design and build a monitoring information system for follow-up on examination results as a form of digitalization of the audit process within the BKN. This system is developed using web-based technology, with Laravel as the backend framework, PHP as the main programming language, and MySQL as the database. The development process uses the Waterfall method which includes stages of analysis, system design using UML, implementation, and testing. To ensure the functionality of the system, black box testing is conducted which shows that all main features operate according to user requirements. In addition, the system evaluation was conducted through a user satisfaction questionnaire among several relevant employees at BKN, and achieved a satisfaction level of 87%, indicating a positive acceptance of the developed system. This system enables the recording, monitoring, and reporting of follow-up actions from inspections to be done in a structured, real-time, and well-documented manner, while also supporting increased transparency and accountability within governmental agencies.

Keywords: Audit; National Civil Service Agency; Digitalization; Information System; Follow-up.

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1. Introduction

Internal and external audits are an important part of the monitoring and evaluation system of government agencies (Kuntadi, 2023). One of the crucial aspects of the audit process is the follow-up on the findings of inspections conducted by oversight agencies such as the Audit Board of Indonesia (BPK), the Inspectorate General, or the Government Internal Supervisory Apparatus (APIP). This follow-up reflects the commitment of the agency to uphold accountability, improve performance, and rectify the weaknesses in systems and procedures identified during the audit process.

However, in the environment of the National Civil Service Agency (BKN), the process of monitoring the follow-up of examination results is still done manually using physical documents, emails, and spreadsheets. This procedure not only complicates the tracking of the status of the completion of recommendations, but it is also prone to input errors, data duplication, reporting delays, and the unavailability of real-time information. These conditions hinder the effectiveness of supervision and potentially reduce transparency and accountability in the management of audit results.

Along with the development of information technology, the digitalization of the audit process through integrated information systems has become an urgent necessity. Information systems can support the monitoring process in a systematic, documented, and accurate manner, and can also accelerate workflow between units within the agency (Mozin et al., 2025). Therefore, this research aims to design and build a Monitoring Information System for Follow-up Audit Results at the BKN, utilizing web-based technology. This system is expected to be a solution in improving the efficiency and effectiveness of managing follow-up audit results.

In this study, the system was developed using the Waterfall model of the System Development Life Cycle (SDLC) approach by leveraging PHP, Laravel, and MySQL technologies. The system was tested using black box testing methods to ensure functionality, and evaluated through user satisfaction surveys. With this system, it is hoped that BKN can improve the quality of organizational governance to be more transparent, accountable, and performance-oriented.

Various previous studies have discussed the development of information systems to support audit and monitoring functions in the government sector. For example, a study by (Andry et al., 2023) developing a web-based monitoring information system to track the recommendations of inspection results in educational institutions. The research successfully demonstrated that the digitalization of the audit process can expedite the delivery of reports and facilitate audit data analysis.

Another study by (Kausar et al., 2024) designed a monitoring system for audit findings based on a desktop application in local government agencies. The system facilitates input of findings and follow-up reporting, but it is less flexible as it is limited to a local work environment (standalone) and does not support real-time data access from various locations.

In addition, (Hafid et al., 2022) develop a findings reporting system based on spreadsheets integrated with Google Workspace. Although it is fairly efficient for small organizations, this approach does not ensure data security and information integrity in the long term.

From previous studies, it can be concluded that although there have been efforts at digitization in the audit follow-up process, most of the systems developed are still general in nature, not specific to central government agencies like BKN, and have not adequately accommodated the structural workflow between units. There are still few systems specifically designed to support traceability, electronic documentation of audit results, and hierarchical and controlled follow-up reporting.

This research has several aspects of novelty compared to previous studies, including a system specifically designed for the context and needs of the National Civil Service Agency (BKN), which has its own structure and workflow in managing the follow-up actions from audits conducted by various oversight agencies such as the BPK, BPKP, and the Inspectorate. The system is developed using a web-based architecture with the Laravel framework, thus supporting real-time access, multi-user functionality, and

inter-unit work in various regions of BKN. This system is part of the initiative to improve government governance based on digital principles, by providing an electronic record of the audit follow-up process as the basis for documentation and organizational accountability.

2. Literature Review

Information System

Information systems are a combination of information technology and human activities that use that technology to support operations and management (Hafid et al., 2022). According to (Bagus Tri, 2020), Information systems are a set of interacting components that collect, process, store, and disseminate information to support decision-making, coordination, and control within an organization. In this context, information systems are designed to assist government agencies in managing the process of monitoring follow-up on inspection results more effectively and efficiently.

Audit and Follow-up of Audit Results

Auditing in the public sector is a systematic process to evaluate operational, financial, and compliance activities with regulations (Ulum, 2024). Based on the Regulation of the Financial Audit Agency Number 2 of 2017, the audited entity is required to follow up on the recommendations of the audit results and submit them to the BPK within the stipulated time frame. The process of following up on the audit results is an important indicator in assessing the accountability of organizational performance, including in the performance accountability report of government agencies (LAKIP).

Previous Study

Several relevant studies have been conducted in the context of developing audit information systems. (Pribadi et al., 2024) developing a web-based monitoring information system for the regional education office, but the system is still local and does not support multi-level reporting between units. Research by (Kusumawati, 2024) discussing an integrated spreadsheet-based follow-up system for findings, but facing challenges in data security and information consistency. This research fills that gap by developing a more secure, flexible web-based system that is integrated with the BKN bureaucratic structure.

The development of an information system for monitoring the follow-up of inspection results at the National Civil Service Agency (BKN) in this research utilizes several latest technologies that meet the needs of scalability, ease of maintenance, and real-time access. The main technologies used include:

PHP (Hypertext Preprocessor)

PHP is a server-side programming language that is widely used in web development (Simajuntak, 2016). PHP is open-source, easy to learn, and has comprehensive documentation. With its dynamic nature, PHP allows for interactive data manipulation, form processing, and database connectivity. PHP is used in this research as the backend foundation of the system to handle business logic, authentication processes, and data communication between system components (Risdianto, 2025).

Laravel Framework

Laravel is a PHP framework based on the Model-View-Controller (MVC) architecture that is very popular because it supports structured, secure, and efficient application development. Laravel provides various modern features such as Routing, Eloquent ORM (Object Relational Mapping), Blade templating engine, and middleware that facilitate user authentication and authorization management (MAILOPUW, 2024). In the context of this system, Laravel is used to manage the flow of application logic, user role management (such as admin, auditor, and implementing unit), and the processing of follow-up inspection status.

MySQL Database

MySQL is a relational database management system (RDBMS) used to store and manage system data in a structured manner (Siregar et al., 2024). MySQL is chosen for its reliability in handling large volumes of data, multi-user support, and excellent integration with Laravel. The system stores information such as recommendation data from examinations, follow-up status, system users, and the history of data changes as an audit trail.

HTML, CSS, and JavaScript

Front-end technologies such as HTML (for structure), CSS (for design), and JavaScript (for interactivity) are used to build responsive and user-friendly interfaces (Musyaffa et al., 2024). In this system, the use of JavaScript is combined with libraries like Bootstrap for responsive design and user interface layout.

XAMPP (Apache, MySQL, PHP, Perl)

The local development environment uses XAMPP, which is an open-source software package that combines the Apache server, MySQL, and PHP interpreter. XAMPP is used to run the system locally before it is implemented on the production server (Ramadhan & Ma'sum, 2025).

Blackbox Testing

To ensure that all system functionalities operate according to user requirements, a black box testing is conducted, which is a software testing method that focuses on input-output functions without looking at the internal structure of the code (Sima & Wattiheluw, 2023). This test was conducted on the login feature, data input for examinations, tracking the status of follow-ups, uploading evidence, as well as recap reports of follow-up results.

3. Design/Methods

This research uses a Research and Development (R&D) approach aimed at designing, developing, and testing an information system that can be used to monitor the follow-up on the results of inspections at the National Civil Service Agency (BKN). The system development is conducted using the System Development Life Cycle (SDLC) with a Waterfall model, which consists of five main stages as follows:

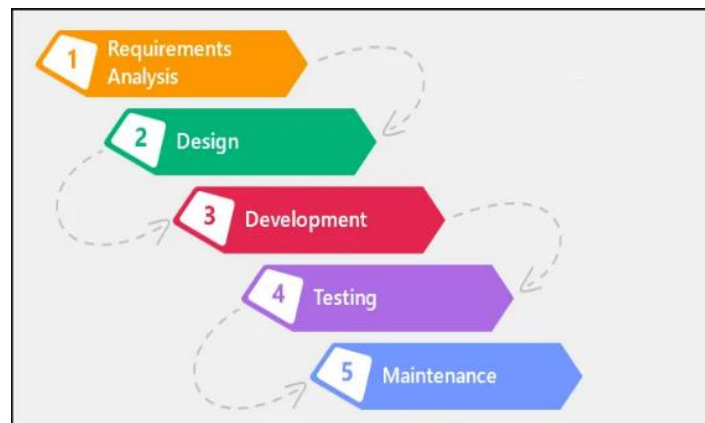


Figure 1. System Development Life Cycle (SDLC) Waterfall Model

Needs Analysis

At this stage, data is collected through direct observation, interviews with internal auditors and system users at BKN, as well as document studies related to the follow-up process of audit results. The analysis results indicate the need for an integrated system that can document the status of follow-ups in real-time, manage digital evidence, and facilitate summary reporting by the supervisory unit.

System Design

System design is conducted using an Object-Oriented approach with the help of Unified Modeling Language (UML). The diagrams used include:

1. Use Case Diagram to describe actors and interactions with the system.
2. Activity Diagram to show the flow of follow-up process.
3. Class Diagram to model the data structure of the system.
4. The user interface is also designed with user-friendly and responsive principles so that it can be accessed both through desktop and mobile devices.

Implementation

The system is developed using the PHP programming language, with the Laravel framework, MySQL as

the database, and the XAMPP development environment. The main modules of the system include recommendation management for inspections, tracking follow-up status, uploading follow-up evidence, notifications, and summary reports. The Laravel folder structure is utilized to separate application logic, view, and database.

Testing

Testing is conducted using the Blackbox Testing method, which involves functionality testing of the system without looking at the source code (Jibril, 2024). Each module is tested based on usage scenarios to ensure that the system can accept input and produce appropriate output. Testing is carried out on the login and authentication modules, the input and recommendation tracking modules, and the reporting and document download modules. The test results show that all system functions operate according to the specified requirements.

4. Results

This research successfully designed and implemented a web-based information system aimed at monitoring the follow-up results of inspections at the National Civil Service Agency (BKN). The developed system integrates the previously separate manual audit processes that were not documented in real-time into a structured digital platform that is easily accessible by various related units.

Architecture of Follow-Up Information System of Audit Results



Figure 2. Architecture of the Information System for Follow-Up on Examination Results

Figure 2 shows the architecture of the follow-up information system based on the results of the examination, where in the system there are three actors that run the system, namely the Work Unit, Administrator, and Inspectorate. The Administrator is responsible for managing all user data of the follow-up information system for audit results at the National Civil Service Agency. The Work Unit user is responsible for following up on the findings of the audits that have been carried out, while the Inspectorate is responsible for managing the findings data, recommendation data, follow-up results, audit reports, and performing follow-up actions.

Database Design

The database design in this system aims to store and manage data in a structured and integrated manner to facilitate the processes of input, monitoring, and reporting follow-up results of inspections. The database is designed using the MySQL relational database, which consists of several main tables as follows:

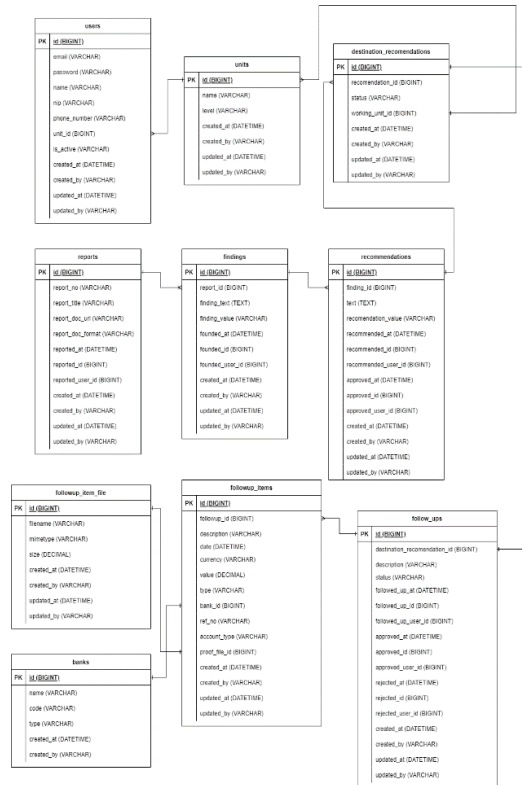


Figure 3. Database Design

User Interface Design

The user interface (UI) design in this system is primarily aimed at providing an easy, intuitive, and efficient user experience for all types of users at the National Civil Service Agency, from admins, auditors, to implementing units.

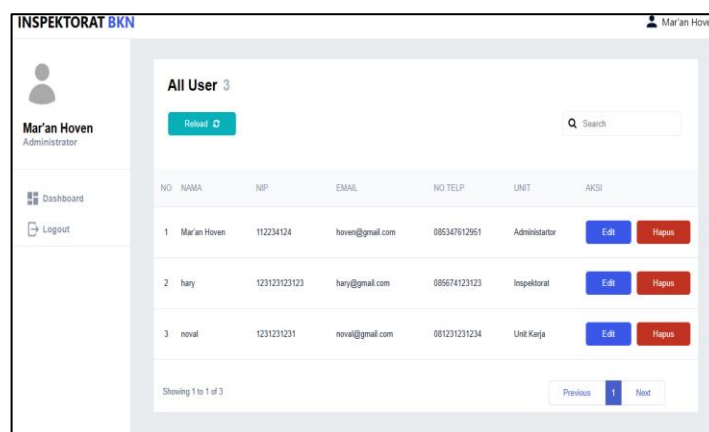


Figure 4. User Role Page

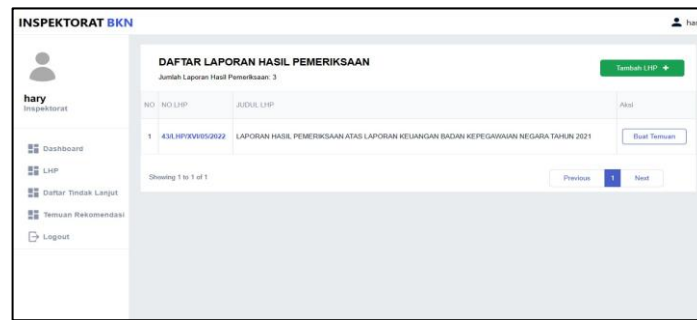


Image 5. Inspectorate Role Page

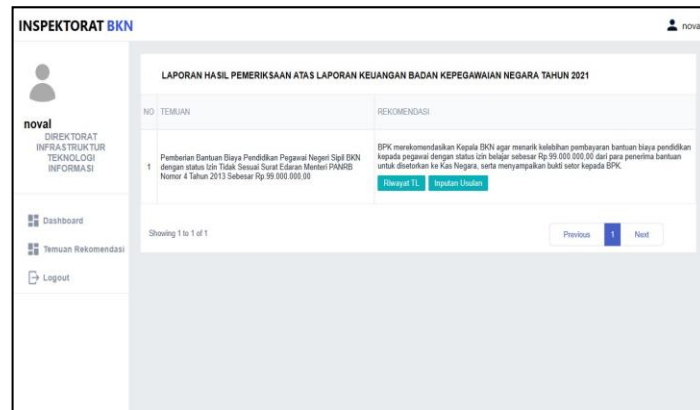


Figure 6. Unit Work Interface Page

5. Discussion

The needs analysis is a very important initial stage in the development of this information system. The goal is to gain a deep understanding of what the users and the organization need in the process of monitoring follow-ups of inspection results so that the developed system can optimally meet both functional and non-functional objectives.

Functional Requirements

Functional requirements are the functions that the system must have to support users in monitoring and managing the follow-up of inspection results, including:

- 1) User management, the system must be able to manage user data with various roles (admin, auditor, implementing unit) and set access rights according to their respective roles.
- 2) Input Data Inspection, the system must allow the admin or auditor to enter inspection result data that contains complete information such as report number, type of inspection, related unit, recommendations, and follow-up deadlines.
- 3) Monitoring the Status of Follow-up, the implementing unit must be able to access the list of recommendations that need to be followed up on, as well as update the follow-up status in real-time (not followed up, in progress, completed).
- 4) Upload Follow-Up Evidence, the system must provide a feature to upload supporting documents as proof of completion of the follow-up from the inspection results.
- 5) Verification and Validation, the auditor or admin must be able to verify the evidence uploaded and provide comments or approval regarding the follow-up.
- 6) Reporting, the system must be able to generate recap reports of follow-up results based on various parameters (time period, work unit, status) in an easily readable and downloadable format (PDF, Excel).
- 7) Notification, the system needs to send notifications to users regarding follow-up deadlines and status changes.

User Needs Analysis

The system requirements are the result of data collection and analysis of the issues concerning the currently running system; the following are the system requirements that the researchers have identified:

1. Analysis of Administrator Needs

The administrator can add, update, and delete users of the Monitoring Follow-Up Information System, including name, NIK, and Access Level (administrator, work unit, or inspectorate).

2. Analysis of Inspectorate Needs

- 1) The inspectorate can add audit reports and view findings and recommendations from those audit reports.
- 2) The inspectorate can create, update, and delete findings from the audit report that have been added.
- 3) The inspectorate can make recommendations from the findings that have been added.
- 4) The inspectorate can send recommendations to the intended working unit.
- 5) The Inspectorate can see the Recommendations from the recommendations that have already been followed up by the work unit.
- 6) The inspectorate can validate the follow-up actions provided by the working unit.
- 7) The inspectorate can see the list of audit reports that includes information on the title of the audit report, the number of recommendations, and the status of the recommendations.
- 8) The Inspectorate can take Follow-up actions on each recommendation in each audit report.
- 9) The Inspectorate can see the History and status of Follow-up that has been addressed.

Analysis of Work Unit Needs

- 1) Work units can view the list of audit reports that contain information on the title of the audit report, the number of recommendations, and the status of the recommendations.
- 2) The Work Unit can take Follow-up actions on each recommendation in each audit report.
- 3) The Work Unit can see the status of the Follow-up that has been addressed.

6. Conclusion

The conclusion of the Monitoring Information System for Follow-Up on the Results of BKN Inspectorate Inspections is that the developed information system provides a solution to monitor the development of progress in following up on audit results directly. The implementation of the Follow-Up Monitoring Information System for Audit Results increases efficiency and reduces paper use because it is done digitally without using physical documents. The Follow-Up Monitoring Information System for Audit Results makes it easier for auditors to present follow-up evidence data, as it can be accessed and conducted flexibly, both at suitable locations and times.

Recommendation

The system needs to be integrated with other existing applications in the BKN environment, such as the personnel system, electronic document management (e-office), and the internal control system. This will enable automatic data exchange and reduce duplicated data entry by users. It is highly recommended to add automatic notification features via email or SMS to users regarding follow-up

deadlines and changes in inspection status. This will help increase users' awareness of their obligations and the progress they need to achieve.

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