
Web-Based Periodic Salary Increase Information System at The Biddokkes Polda Jambi Using Waterfall Method

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ABSTRACT

The administrative process for periodic salary increases for personnel at the Biddokkes Polda Jambi currently faces efficiency challenges, including the risk of data entry errors and delays in monitoring the salary increase periods. This study aims to develop a web-based periodic salary increase information system capable of automating data collection and providing timely notifications. The system development method used is the Waterfall model, which includes the stages of requirements analysis, design, coding, testing, and maintenance. The results of the study indicate that the developed system successfully minimizes data input errors and accelerates the administrative verification process compared to manual methods. Through functional testing using the Black Box Testing techniques and User Acceptance Test (UAT) evaluation, all major system features were proven to function with a 100% success rate and were well-received by users, as evidenced by a system acceptance rate of 90%. With this system in place, human resource management at the Biddokkes Polda Jambi become more measurable, transparent, and effective in supporting personnel administration processes.

Keywords: Information System; Salary; Website; Waterfall; Biddokkes

INTRODUCTION

Personnel administration management in government agencies, particularly within the Indonesian National Police, demands a high level of accuracy, transparency, and timeliness. At the Biddokkes Polda Jambi, the management of periodic salary increases for personnel is a crucial aspect closely related to the welfare and work motivation of members. However, the reality on the ground shows that this process is still dominated by conventional mechanisms that relying on manual record-keeping and physical archiving storage, which are vulnerable to damage (Arif Febriansyah & Setiawan, 2025).

Data management that has not been digitally integrated poses significant challenges, such as the risk of data redundancy, difficulties in tracking salary increase periods in real-time, and the potential for human error during the verification process. This often results in delays in issuing the Periodic Salary Increase Decision Letter (Eviana & Sihombing, 2017).

In the digital age, an organization's operational efficiency depends on the adoption of information technology to replace slow manual processes (Syukron & Abdurrazaq, 2021), (Zulhendra & Bunga Riska Amalia, 2022). Data inaccuracies in manual systems often pose a major obstacle to managerial decision-making. Therefore, a technological solution in the form of an integrated web-based information system is needed to transform this administrative management process (Kurnia & Nurmailis, 2020). The implementation of this system is expected to provide added value through automated data processing, the provision of reminder features for administrators, and easy data accessibility for leadership to conduct monitoring.

The objective of this study is to design and develop a web-based periodic salary increase information system that is functional and easy to operate by both administrative staff and management. Through a structured software development approach, this system is expected to serve as a foundation for the

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modernization of human resource management and internal administration within the Biddokkes Polda Jambi.

LITERATURE REVIEW

Several previous studies have examined the development of similar systems. Research conducted by (Eviana & Sihombing, 2017) on the development of a Periodic Salary Increase Administration Application for the Regional Disaster Management Agency of West Kalimantan Province used the Waterfall method to address process delays caused by manual data storage. Furthermore, research conducted by (Kurnia & Nurmailis, 2020) focused on the design of a Periodic Salary Increase Information System at the Social Office of Riau Province, with an emphasis on minimizing typing errors. Finally, research conducted by (Adrianto & Wahyuni, 2021) implemented a similar application at the Education and Culture Office of Dumai City to facilitate the search for personnel records.

Based on this literature review, a research gap has been identified: most previous studies have focused on civilian agencies. There have not been many studies that specifically integrate the bureaucratic process of periodic salary increases with the operational characteristics and internal administrative regulatory structure of police institutions, particularly at the Biddokkes Polda Jambi. This study will design a system specifically tailored to the workflows and administrative procedures of the Indonesian National Police.

METHOD

The research method applied in information systems is the Waterfall method, which adopts a sequential workflow that ensures the entire system evolution process is well-documented through logically organized stages (Kharisma et al., 2022).

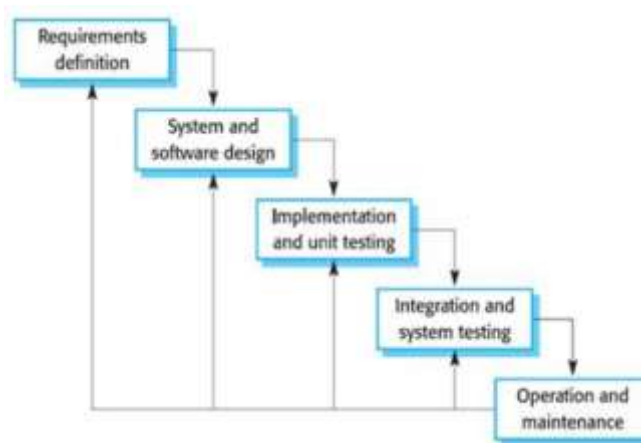


Figure 1. Waterfall method (Kharisma et al., 2022)

The selection of this method is based on the characteristics of the system, which requires a systematic, structured, and sequential development process to ensure that every administrative requirement at the Biddokkes Polda Jambi is met with precision (Ajusta, 2018). Based on the issues outlined in the introduction, the Waterfall method stages implemented include:

a. Requirements Analysis

In this initial phase, the researchers conducted in-depth data collection to understand the periodic salary increase business process currently in place at the Biddokkes Polda Jambi (Tiauw et al., 2025). Activities included observing physical personnel documents and interviewing administrative staff to identify key challenges, such as data redundancy and delays in tracking length of service (Ajusta, 2018), (Mutmainnah et al., 2025).

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b. System Design

Once the system requirements have been identified, the next step is to design the software architecture. The researchers created a system model using the Unified Modeling Language (UML), which consists of a Use Case Diagram and Class Diagram (Lilis Emalia & Vebbry Meidiliana, 2020), (Ardianto Moenir & Fajar Yulianto, 2017), (Zarnelly & Rusmitasari, 2015).

c. Implementation

At this stage, the system design is translated into a programming language. The application was developed using the PHP programming language with a MySQL database (Fitri Kurniasari & Nining Rahaningsih, 2023). The researchers performed modular coding, in which each feature such as the personnel data input module, the periodic salary increase calculation module, and the notification system was built and tested independently before being integrated into a single, complete system.

d. Integration and Testing

The system that was developed then underwent intensive testing to ensure that all functionalities operated as planned. The testing method used was Black Box Testing, which focuses on testing the system's functional units without examining its internal code structure (Fitri Kurniasari & Nining Rahaningsih, 2023), (Zarnelly & Rusmitasari, 2015). The researchers ensured that the system was capable of accurately identifying personnel eligible for a salary raise and that document validation could be performed without technical obstacles.

e. Operation and Maintenance

The final stage is the implementation of the system in the operational environment of the Biddokkes Polda Jambi. After the system was deemed suitable through testing, it was installed on the server, and training was provided for user staff (Arif Febriansyah & Setiawan, 2025). The maintenance phase includes fixing any minor bugs found post-implementation as well as adjusting the system to future salary increase regulations to ensure the application remains relevant and optimal in supporting organizational performance.

RESULT

The system that was previously operated manually at the Biddokkes Polda Jambi has now been successfully transformed into a web-based periodic salary increase information system. This system facilitates personnel data management, calculation length of service, and report printing.

System Implementation

a. Login Page

The login page in this system is the first step in software security architecture. The display of the login page can be seen in Figure 2.



Figure 2. Login Page

After the user enters their identification information correctly, the system will match the data against the user table in the database, then redirect the user to the dashboard page corresponding to their authorization level.

b. User List Page

Admin can add users to the list, the display of the user list page can be seen in Figure 3.



Figure 3. User List Page

The user list page is a specialized interface designed with restricted access rights limited to users with Administrator privileges. This interface serves as the account management control center within the system. The workflow on this page begins when an Administrator accesses the user list page, at which point the system automatically retrieves data from the database to present information on all registered users in a systematic table format.

c. Personnel Data Page

Admin and users can add personnel data, the display of the personnel data page can be seen in Figure 4.

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Figure 4. Personnel Data Page

d. Periodic Salary Data Page

Admin and users can add periodic salary data, the display of the periodic salary data page can be seen in Figure 5.

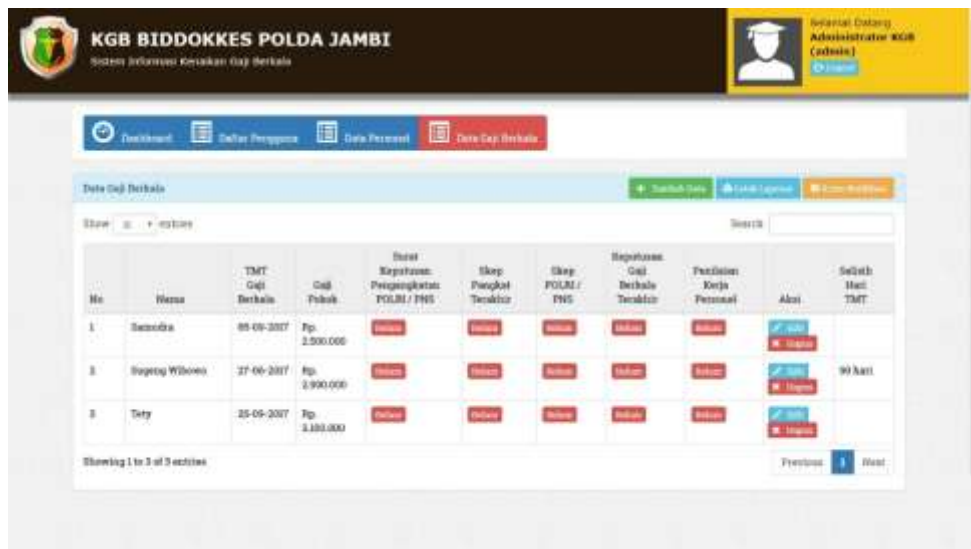


Figure 5. Periodic Salary Data Page

e. Print Periodic Salary Report

Click the print button in the upper right corner, then specify the periodic salary report period as follows.

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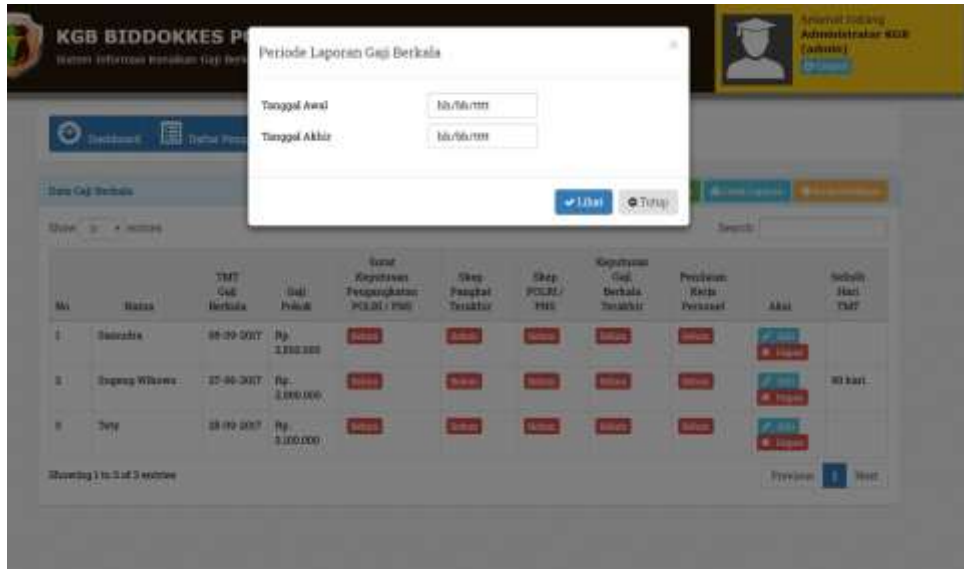


Figure 6. Print Periodic Salary Report

This will generate a report as shown below.



Figure 7. Periodic Salary Report

System Evaluation and Testing

To ensure the system functionality and quality, testing was conducted using the Black Box Testing method which focuses on evaluating functional inputs and outputs without examining the code structure as well as a User Acceptance Test (UAT) to evaluate user acceptance.

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Table 1. Black Box Testing Results

No	Module Tested	Test Scenario	Expected Results	Status
1	Login	Enter a valid username and password	The system redirects to the Dashboard	Valid (100%)
2	User Management	Add and delete users	User data is stored/deleted in the database	Valid (100%)
3	Personnel Data	Enter Name, Position, and NRP data	The system saves new data without duplication	Valid (100%)
4	Periodic Salary	Entering salary effective date data	The system calculates the period and saves the data	Valid (100%)
5	Print Report	Select the start and end periods	The system generates a PDF document of the Periodic Salary report	Valid (100%)

Based on Table 1, all major system functionalities operate in accordance with the software requirements specifications. Additionally, a quantitative evaluation using a UAT questionnaire distributed to administrative staff result a system acceptability rating of 90%, indicating that the interface is user-friendly and the system effectively replaces manual processes.

User Acceptance Testing (UAT) was conducted to measure the level of user acceptance of the information system that had been developed. This testing involved 10 respondents consisting of administrative staff and data management personnel at the Biddokkes Polda Jambi.

Table 2. User Acceptance Test (UAT) Questionnaire Results

No	Questionnaire Statement	SS (5)	S (4)	R (3)	TS (2)	STS (1)	Total Score	Max Score	Percentage
1	This information system is easy to learn and operate (user-friendly).	6	4	0	0	0	46	50	92%
2	The features for entering and calculating length of service and periodic salary function accurately.	5	5	0	0	0	45	50	90%
3	This system effectively speeds up the verification and reporting processes.	7	3	0	0	0	47	50	94%
4	The system interface is attractive, and the information is easy to read.	4	5	1	0	0	43	50	86%
5	Overall, this system is very helpful for Biddokkes Polda Jambi administrative processes.	5	4	1	0	0	44	50	88%
Average Approval Rate (System Feasibility)		-	-	-	-	-	225	250	90%

Based on Table 2, the total score obtained from the five questionnaire statements was 225 out of a maximum score of 250. The average percentage obtained was 90%. In accordance with the system feasibility interpretation criteria, the figure of 90% falls under the “Strongly Agree” category. This demonstrates that this Web-Based Periodic Salary Increase Information System is well-received by users and has proven to streamline administrative work at the Biddokkes Polda Jambi.

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DISCUSSIONS

The implementation of this information system addresses the challenges identified in the manual administrative workflow of the Biddokkes Polda Jambi. Previously, data management was not digitally integrated, making it difficult to track salary increase periods in real-time and potentially causing delays in the issuance of Decision Letter. The following is the current system workflow at the Biddokkes Polda Jambi.

- a. Manual data recording and physical archiving.
- b. Data management that is not yet digitally integrated poses a risk of data redundancy.
- c. Difficulty in tracking salary increase periods in real-time.
- d. Human errors occurring during the verification process.
- e. Delays in issuing the Periodic Salary Increase Decision Letter, which directly impacts the delay in financial entitlements that personnel should receive.

System requirements analysis

The system requirements specification includes automatic reminder features, an integrated personnel database, and a multi-tiered verification mechanism that complies with the Indonesian National Police internal regulations. The system modeling is designed using the Unified Modeling Language (UML), which includes Use Case Diagram to describe user interactions with the system (Maulana et al., 2024) , as well as Class Diagram to represent data structures and relationships between classes within the system (Lilis Emalia & Vebby Meidiliana, 2020), (Ardianto Moenir & Fajar Yulianto, 2017), (Zarnelly & Rusmitasari, 2015).

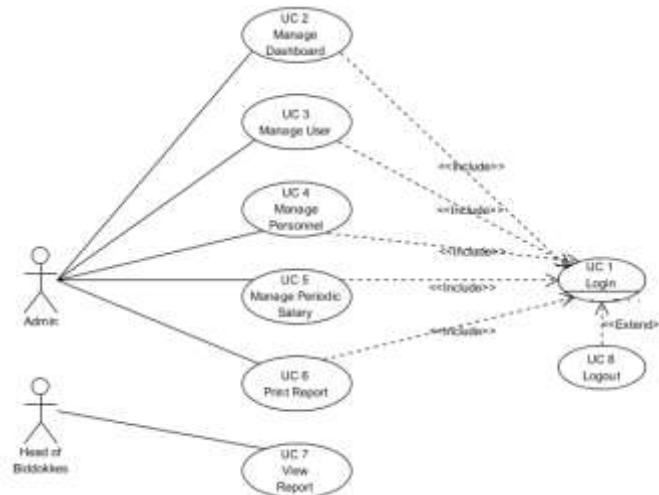


Figure 8. Use Case Diagram

In addition, a database structure was designed to ensure the integrity of personnel data, as well as a user-friendly web-based user interface.

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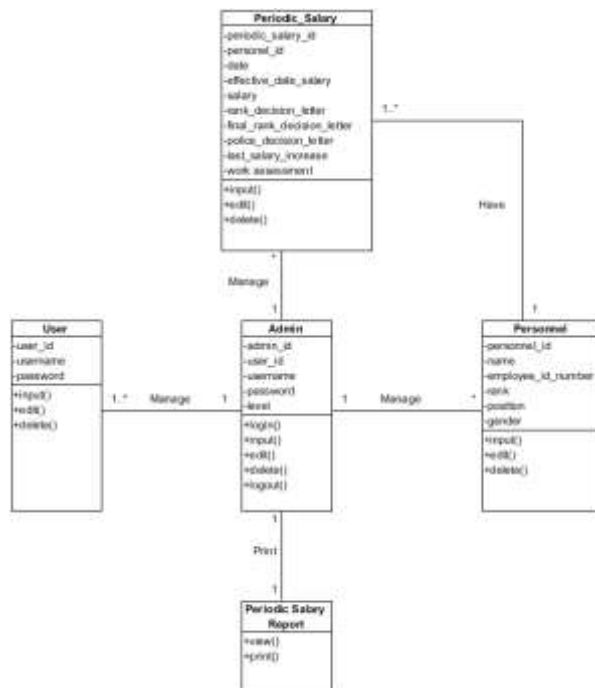


Figure 9. Class Diagram

CONCLUSION

This study has successfully developed and implemented a web-based periodic salary increase information system at the Biddokkes Polda Jambi. The Waterfall approach ensured that the system was built in alignment with the agency’s bureaucratic workflow. Based on Black Box Testing evaluations, all system modules were found to be valid and fully functional in accordance with the specifications, and capable of addressing the issues of data redundancy and document tracking inefficiencies that occurred in the previous manual system. Currently, the system operates as a standalone system within the scope of local administration. For future development, it is recommended that further studies be conducted regarding API integration between this system and the central personnel database at the Indonesian National Police Headquarters to ensure personnel data synchronization on a broader scale.

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