

Design Of The Information System Model For Kodim 1416/Muna Administration Process Using The Rad Method With Whatsapp Based Notification

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Abstract. Globalization, driven by advancements in information technology, demands fundamental changes across various life aspects, including the operations of companies and organizations. Kodim 1416/Muna faces issues in daily reporting and administration due to reliance on WhatsApp, varying report formats, and delays in administrative approvals. This research aims to design an information system model to address these problems using the Rapid Application Development (RAD) method, encompassing requirements planning, design, and implementation. The designed system is expected to standardize daily reports, reduce the risk of overlooked information, expedite the submission process, and facilitate monitoring by leaders through WhatsApp notifications. System Usability Scale (SUS) testing results show a score of 81, categorized as "Good Performance," indicating user satisfaction with the designed system. Thus, this research contributes to improving operational efficiency and administrative performance at Kodim 1416/Muna.

Keywords : Daily Reports, Information System, Kodim 1416/Muna, RAD, WhatsApp Notifications

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INTRODUCTION

With the advancement of technology, the demand for fast, precise, and accurate information is very important in the corporate environment. Therefore, the presence of information systems is an essential requirement for companies in carrying out their business operations. Information systems are able to provide efficient means of communication within organizations or between organizations at an affordable cost, high level of accuracy, and optimal speed[1]. The main tasks of the Army in pledging to maintain the sovereignty of the land territory of the Unitary State of the Republic of Indonesia, protect the integrity of the territory in accordance with the principles of Pancasila and the 1945 Constitution of the Republic of Indonesia, and ensure protection for the entire nation and Indonesia's cultural heritage from potential threats and disruptions to the integrity of the state, can be described through the implementation of several functions. Among them, the Army carries out the main functions which include combat, posture training, and Territorial Development (Binter). The Army's Territorial Development function includes planning, developing, mobilizing, and escorting resources in the defense area with all its aspects, which aims to build strong strength as part of the space, facilities, and conditions of battle for the benefit of national defense on land[2].

Kodim 1416/Muna is one of the Kodim in Muna Regency, Southeast Sulawesi which is directly under the Military Resort Command (Korem) 143/Halu Oleo and Military Regional Command (Kodam) XIV/Hasanuddin. Kodim 1416/Muna has 7 Koramils including Koramil 1416-01/Katobu, Koramil 1416-02/Tikep, Koramil 1416-03/Tongkuno, Koramil 1416-04/Kabawo, Koramil 1416-05/Maligano, Koramil 1416-06/Lawa, and Koramil 1416-07/Tampo. The task of each Koramil is to supervise community activities in several sub-districts and even in villages. The total number of personnel of Kodim 1416/Muna is 308 personnel.

Currently, babinsa conduct daily reports via Whatsapp with different report templates. There are other problems found, namely report information that is sent repeatedly. This is because reports on Whatsapp accumulate, resulting in a lack of thoroughness in receiving reports. In addition, with the large number of personnel in Kodim 1416 / Muna and there is one Koramil whose island is separate from its unit, it has an

impact on the problem, namely difficulty in evaluating data, creating a risk of missed or poorly understood information and complicating efforts to make decisions from the information presented.

Previous research has shown that the implementation of information technology, especially in the form of information systems, has made a positive contribution to the optimization of time and effort, the accuracy of the information provided from the system, and the responsiveness of the system in responding to changes in information management and administration. So that this research will contribute a design in the form of a standard report used by all Chapters in order to reduce errors and make it easier for leaders to evaluate. In addition, the design of a system that allows electronic submission of letters or administration, including signature approval from the leadership.

The system development method used in this research is the Rapid Application Development (RAD) method. According to Kendall in 2011, the RAD method is divided into three stages that are structured and interdependent with one another, namely the requirements planning stage, the design process (design workshop), and implementation. In the requirements planning stage, functional and non-functional requirements are analyzed. For the design workshop stage, UML design is carried out. While at the implementation stage, coding and testing will be carried out[3]. By using the RAD method, it is able to involve development where users can see and test the functionality of the system at each stage.

Based on the description of the problem above, a research was conducted entitled “Designing an Information System Model for the Administrative Process of Kodim 1416/Muna Using the Rapid Application Development Method with WhatsApp-Based Notifications”. So that it will produce a system that can provide solutions to daily reports, format variability, and administrative delays faced by Kodim 1416 / Muna with notifications from WhatsApp.

METHODS

Research Framework

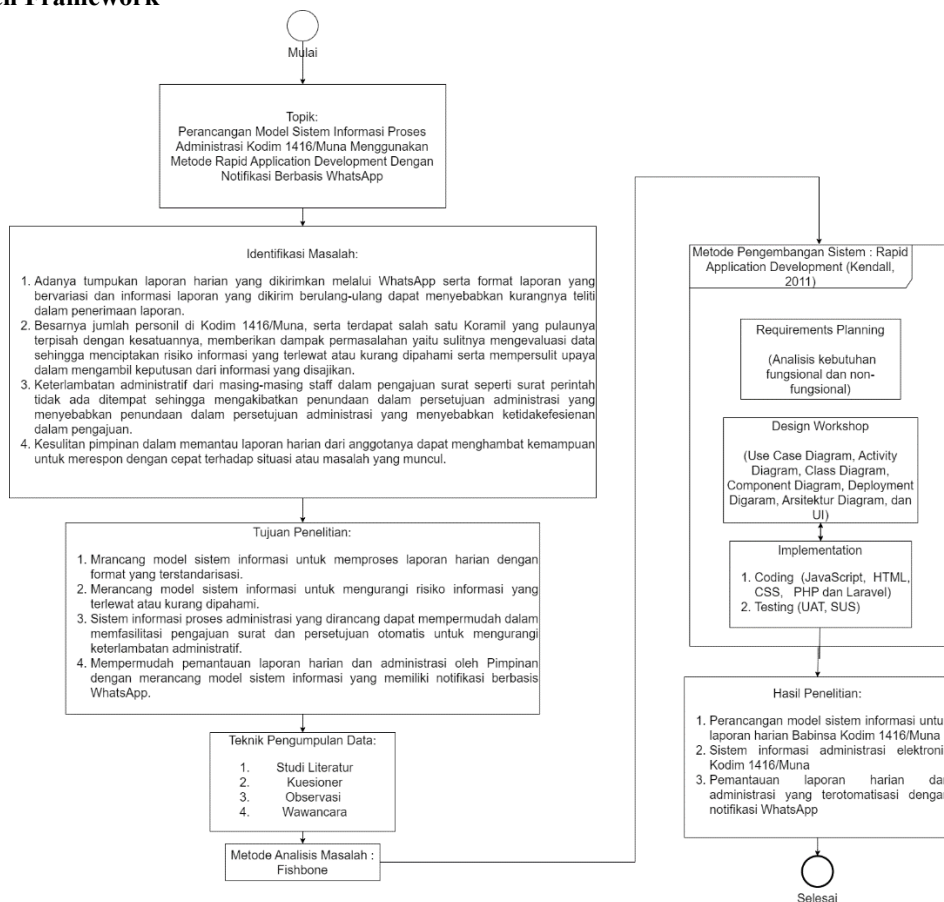


Figure 1 Research Framework

Based on the picture above, there are several causes of the problem, namely:

1. The existence of a pile of daily reports sent via WhatsApp as well as varying report formats and report information sent repeatedly can cause a lack of thoroughness in receiving reports.
2. The large number of personnel in Kodim 1416 / Muna, and there is one Koramil whose island is separate from the unit, has an impact on the problem, namely the difficulty of evaluating data so as to create a risk of missed or poorly understood information and complicate efforts to make decisions from the information presented.
3. Administrative delays from each staff in submitting letters such as orders caused by the absence of other alternatives when the leader is not available, resulting in delays in administrative approval which causes inefficiency in submission.
4. Leaders' difficulty in monitoring daily reports from their members can hinder their ability to respond quickly to situations or problems that arise.

So that the research objectives are obtained, among others:

1. Design an information system model to process daily reports in a standardized format.
2. Design an information system model to reduce the risk of missing or misunderstanding information.
3. The designed electronic Administration information system is expected to facilitate automated letter submission and approval to reduce Administrative delays.
4. Facilitate the monitoring of daily reports and Administration by leaders by designing an information system model that has automatic notifications.

The development methodology used is Rapid Application Development (RAD). This information system model was developed using several diagrams, namely Use Case Diagram, Activity Diagram, Class Diagram, Component Diagram, Deployment Diagram, and Architectural Diagram. In the last stage, namely the stage of implementing the information system model. Based on the framework above, the implementation of the information system model is carried out using the JavaScript programming language with the help of the NodeJs and ReactJs frameworks, as well as HTML, CSS, and Laravel.

The data collection techniques used in this study are as follows:

Literature Study

Literature study is one of the processes in research whose purpose is to find literature about previous research that is in accordance with the research topic to be carried out. The literature study used in this study consists of five discussions of previous research, namely the implementation of RAD (Rapid Application Development) and black box tests on e-archive administration[4], implementation of rapid application development in developing road damage reporting applications [5], web based development of information system administration[6],[7] build a website for Kodim 0403/Oku using Php and MySql, and design a financial information system at the Kotabaru Reteh Lurah Office using the rapid application development (RAD) method[8].

Questionnaire

A questionnaire is a way of collecting data that involves asking a number of questions related to the research issue[9]. The target respondents in this research are Dandim, Danramil and Staff. From the results of the questionnaire it can be concluded that respondents have clear answers to specific report formats, where most emphasize the importance of clear and structured report formats to support their work.

Interview

An interview is a meeting between two individuals who exchange information and ideas through a series of questions and answers. The goal is to build meaning on a particular topic[9]. In this study, there were 3 resource persons who represented members of Kodim 1416/Muna, namely Danramil, Babinsa, and Staff. The results of the interview are that most of them have difficulty in determining the right activity documentation. Where sending reports via WhatsApp often accumulates and causes data to be neglected. In addition, facilities are needed that can speed up and simplify administration. The process of submitting letters that are still manual is also often not on time and causes delays in receipt. So it is hoped that there will be a new transformation that supports the main tasks using IT facilities.

Observation

Observation, or often referred to as observation, involves focusing on an object using all the senses. It is a method of data collection that involves the use of the five senses and detailed recording of the object of

study[9]. Observations revealed complaints about reports being uploaded repeatedly, indicating problems with documentation management and workflow. Therefore, it is necessary to implement adequate technology to ensure documentation is organized and easily accessible to all parties in need.

Problem Analysis

Fishbone diagrams, or more commonly known as fishbone diagrams, are a method or tool used to improve quality. It is also known by another name, the cause-effect diagram.[10]. A fishbone diagram is a visual representation that combines lines and symbols to show the cause and effect relationships of a problem. The far right of the diagram reflects the effect or problem. Fishbone lines or branches illustrate the causes which are grouped into categories such as human, material, machine, method, and environmental factors [11].

To analyze the problem in this study, a Fishbone diagram was used. Can be seen in fig. 2 below:

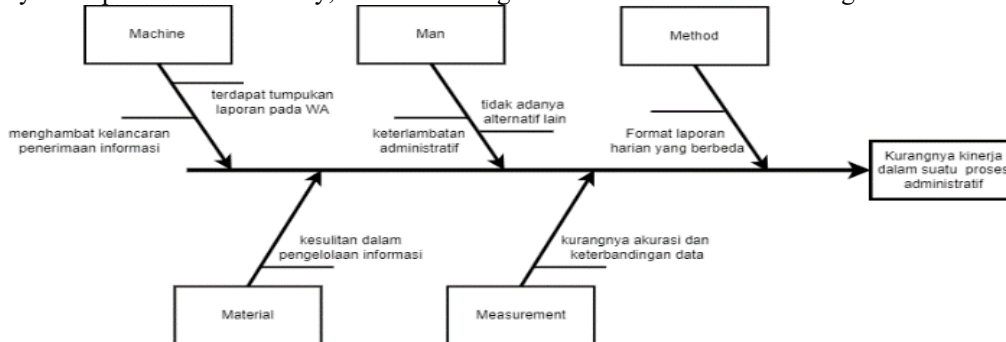


Figure 2. Fishbone Diagram

Based on the Fishbone diagram above, the causes of the lack of performance in the Administrative process at Kodim 1416/Muna consist of 5 categories, including:

1. Machine, utilizing WhatsApp as a platform for daily reports can cause a pile of messages that hinder the smooth receipt of information.
2. Man, the absence of other alternatives to replace when the leader is absent, thus making Administrative delays.
3. Method, with different report formats via WhatsApp, creates difficulties in analyzing data and making the right decisions.
4. Material, because it uses WhatsApp as the main platform. Where WhatsApp does not provide optimization in storing and managing data on a large scale, causing piles of reports that are difficult to manage and difficulties in managing information.
5. Measurement, Inaccurate measurement or evaluation of data due to different report formats, resulting in a lack of data accuracy.

Proposed Business Process

Business Process Modeling Notation (BPMN) is a graphical representation of a business process that reflects the activities of each stage that occurs[12].

1. Submission Letter

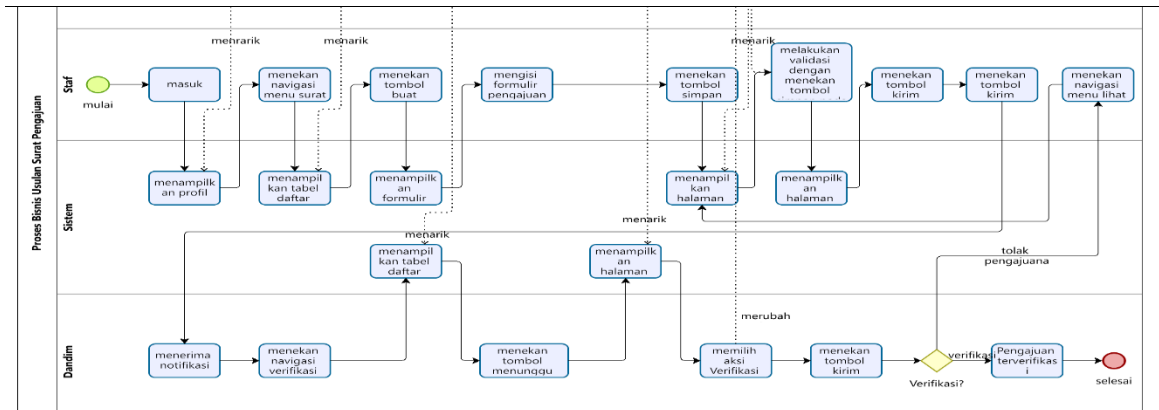


Figure 3. Submission Letter

Based on the picture above, the proposed business process for submission letters, where in getting signature approval is not manually anymore, but a system is used to help speed up the approval process. The initial process carried out is that the staff logs in first to be able to access the system. Then the system displays the employee profile page, then the employee selects the Submission Letter menu. After that, the system displays a list of submission letter tables. Next, the staff presses the create new submission button, then the system will display the submission form. Then the staff will fill in the submission form followed by pressing the save button. After that, the system will display the view & validation page. Then the staff will validate by pressing the save button on the validation tab. Then the system will display the document completeness page. Then the staff presses the send submission button, and presses the send notification button again to send a notification to the Dandim. Then, the Dandim will receive a notification. Next, the Dandim will log in first, after which the Dandim presses the submission verification navigation. Then the system will display a list of submission letters, then the Dandim will press the button waiting for confirmation in the status column. Then the system will display the submission verification. After that, the Dandim will choose the verification action or reject the submission. And finally the Dandim presses the send button. There are two conditions, if the Dandim chooses the action to reject the submission, the Staff will revise the submission by pressing the view & validate menu, then the Staff will revise the submission based on the notes. Then it will continue with the next process. The second condition, if the Dandim chooses the verification action, the submission is successfully verified.

2. Report Babinsa to Danramil

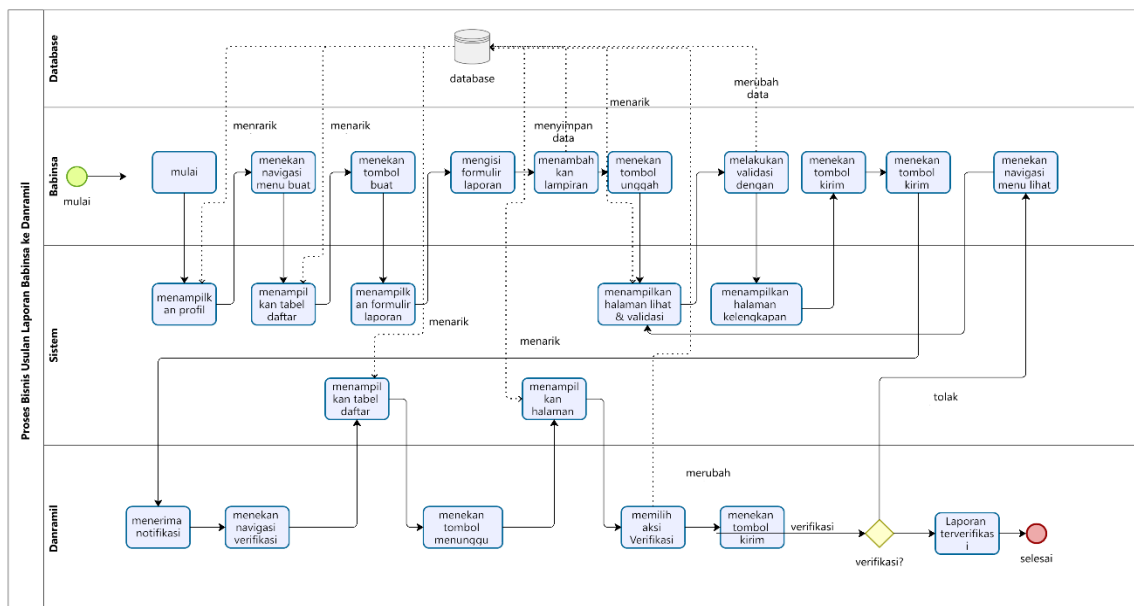


Figure 4. Report Babinsa to Danramil

Based on the picture above, the proposed business process for reports from Babinsa to Danramil. Where to make reports not manually anymore, but assisted by the system. In the picture above, the process is initially carried out by Babinsa, namely by logging in first, then the system will display the Babinsa profile. Next, the Babinsa presses the menu navigation to create a report the system will then display the View & Validate page. Then, the employee validates by pressing the Save button on the Validation tab. Then the system displays the Document Completeness page. Then the staff will press the Submit button and press the Submit Notification button again to send a notification to Dandim. Next, the Babinsa presses the send button, then presses the send notification button again. Then Danramil will receive a notification, then log in first, after which Danramil presses the report verification navigation button. Then the system will display the report list table, then Danramil presses the button waiting for confirmation in the status column. Then, the system displays the report verification page, then Danramil chooses the verification action or rejects the report. And finally Danramil presses the send button. There are two conditions, if Danramil chooses the action to reject the report, then the Babinsa will revise the report by pressing the view & validate menu, then the Babinsa will revise the report based on the notes. Then it will continue with the next process. The second condition, if Danramil chooses the verification action, the report is successfully verified.

3. Report Danramil to Dandim

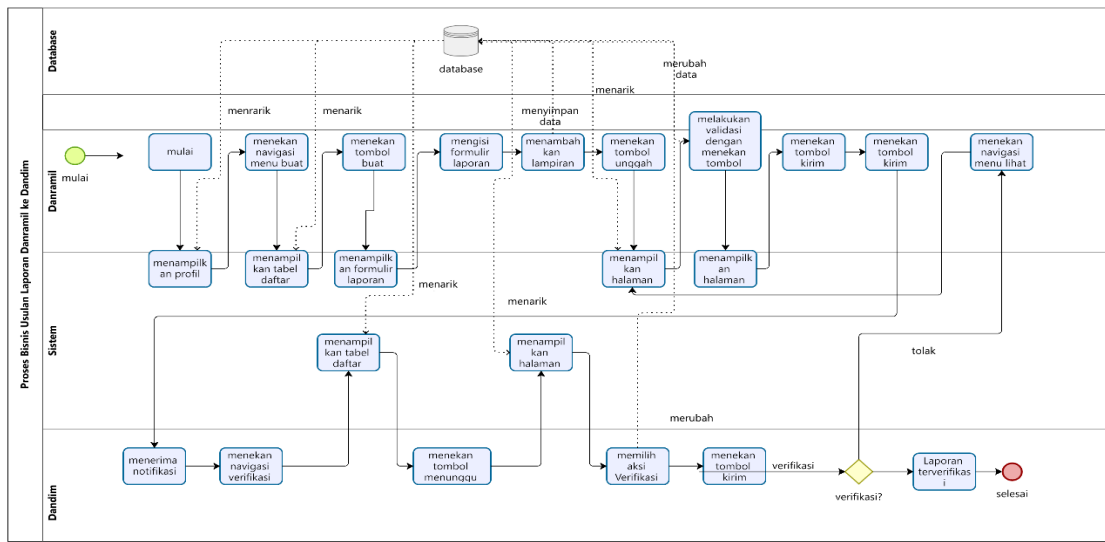


Figure 5. Report Danramil to Dandim

Based on the picture above, the proposed business process for reports from Danramil to Dandim. Where to make reports not manually anymore, but assisted by the system. In the picture above, the process is initially carried out by Danramil, namely by logging in first, then the system will display the Danramil profile. Next, Danramil presses the menu navigation to create a report, the system displays a list of report tables. After that, Danramil presses the create new report button, then the system will display the report form. Next, Danramil fills out the report form, then adds attachments and presses the upload button. The system then displays the View & Validate page. After that, Danramil validates by pressing the save button and the system will display the document completeness page. Next, Danramil presses the send button, then presses the send notification button again. Then the Dandim will receive a notification, then log in first, after which the Dandim presses the report verification navigation button. Then the system displays the report list table. Then the Dandim presses the button and waits for confirmation in the status column. Then, the system displays the report verification page, then the Dandim chooses the verification action or rejects the report. And finally the Dandim presses the send button. There are two conditions, if the Dandim chooses the action to reject the report, then Danramil will revise the report by pressing the view & validate menu, then Danramil will revise the report based on the notes. Then it will continue with the next process. The second condition, if the Dandim chooses the verification action, the report is successfully verified.

System Development Technique

Rapid Application Development (RAD) is a software development model that follows a linear approach and focuses on very short development cycles[13].



Figure 6. RAD Method (Kendall, 2011)

Here are the stages of the RAD system development technique :

1. Requirement Analysis
At the requirement analysis stage, it explains the functional and non-functional needs of the system to be designed.
2. Design Workshop
At this stage, the design of business processes and programming for data in the system architecture is carried out. The tools used in this phase are the Unified Modeling Language (UML), which consists of the use case diagram, activity diagram, class diagram, component diagram, deployment diagram and architecture diagram.
3. Implementation
At this stage, coding is carried out according to the system design at the design workshop stage. The coding used in this research is HTML, CSS, PHP, Laravel, JavaScript, ReactJS, and NodeJS.
4. Testing
At this stage, testing is carried out using the System Usability Scale and User Acceptance Test..

RESULT AND DISCUSSION

Database Design

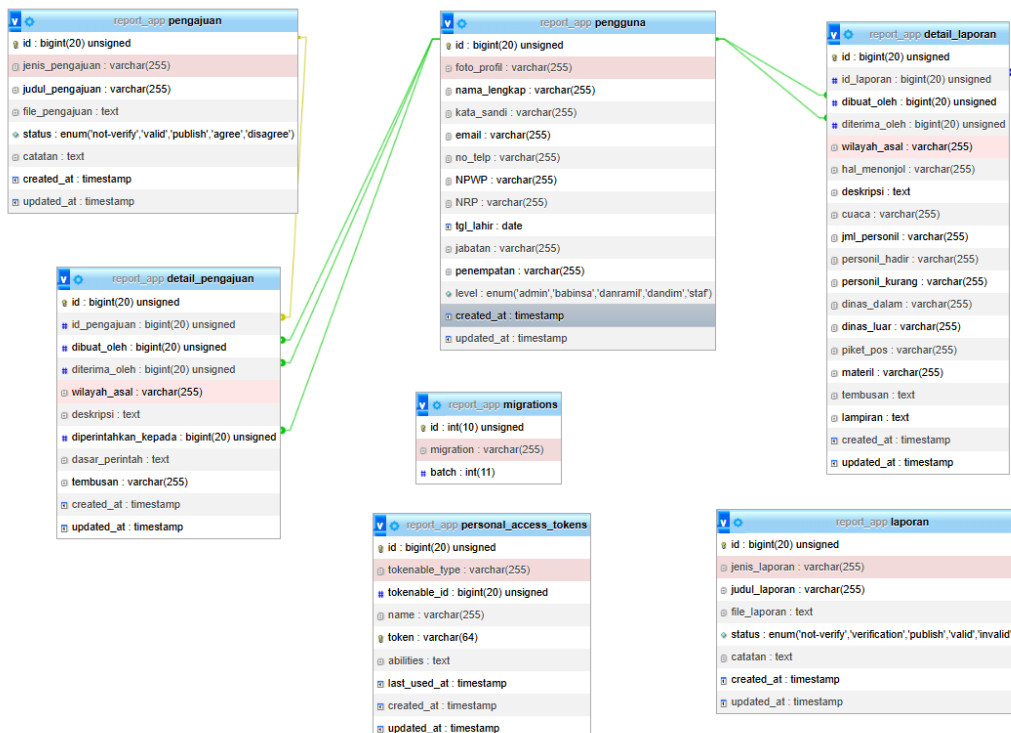


Figure 7. Database Design

The database design in the figure consists of several interrelated tables, namely the **user**, **submission**, **detail_submission**, **report**, **detail_report**, **migrations**, and **personal_access_tokens** tables. The **users** table stores user data such as name, email, position, and level (admin, babinsa, danramil, dandim, staff), which is connected to the **submissions** and **report** tables through foreign keys. The **submission** and **report** tables store basic information related to the letter submission and report created by the user, with the status recorded (e.g., not-verify, valid, publish). The **detail_submissions** and **detail_reports** tables provide more in-depth details, such as recipients, region of origin, description, and related attachments. The **migrations** table records system migration information, while **personal_access_tokens** stores access token data for users. This design reflects the structure of a user-based reporting and submission system with in-depth details and recorded status.

Use Case Diagram

Use Case Diagram is a functional representation used to describe the behavior or behavior of a system to be developed. The User Case Diagram displays an actor or several actors who have a special relationship with the system. Each actor described shows his position and access rights in the system in detail[14].



Figure 8. Use Case Diagram

Based on Figure 8, namely the usecase diagram where there are 6 actors including Staff, Dandim, Danramil, Babinsa, Admin and WhatsApp. Staff actors have access to create submission letters and view a list of all members. Meanwhile, the Dandim has access to be able to see a list of all Kodim members, verify reports from Danramil, verify submission letters from Staff and then receiving report notification and submission letter notification from WhatsApp. Furthermore, Danramil has access to see a list of all members, verify reports from Babinsa, make reports to the Dandim and receiving report notification from WhatsApp. In addition, Babinsa has access to make reports to Danramil and see a list of all members. In this condition, WhatsApp has access send report notification and send submission letter notification. Meanwhile, the Admin has special access, where the Admin can see a list of all members, add member data, change member data, change passwords, make reports both from Babinsa to Danramil or from Danramil to Dandim, create

submission letters, verify reports, verify submission letters and can see Dashboard recaps of reports and submission letters.

Class Diagram

Class Diagram is a visual representation that describes the structure of the system from the perspective of the definition of classes that will be used in system development. The purpose of this diagram is to display the structure of the system by showing the classes, attributes, operations, and relationships between classes after the system is completed[15].

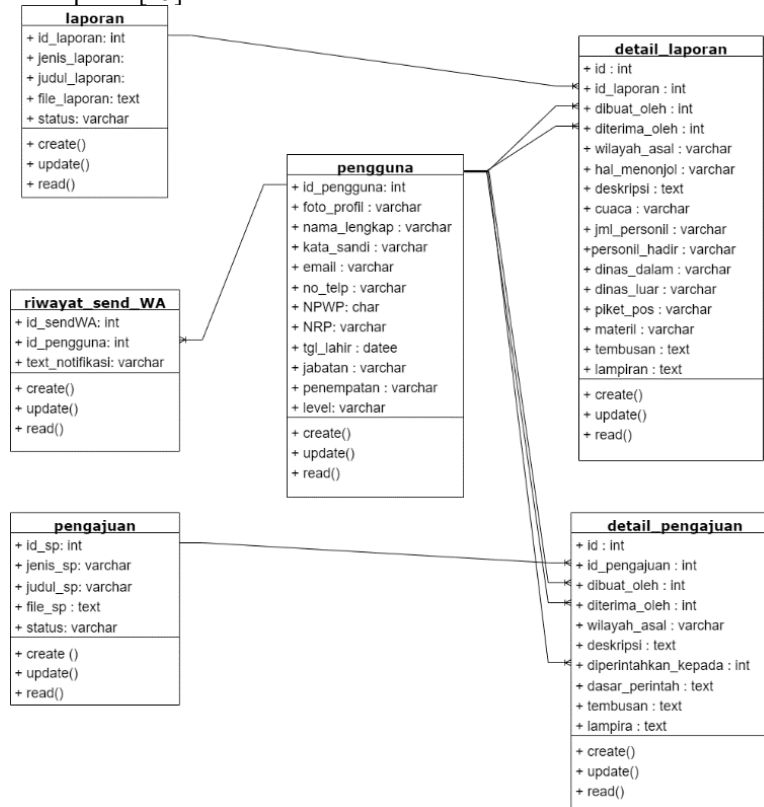


Figure 9. Class Diagram

In the picture above the main tables are reports, detail_reports, users, submissions, and detail_submissions. The report table stores basic information about reports such as type, title, and status. More details about the report are stored in the detail_report table, which is linked to the report table and the user (who creates and receives the report). The user table stores information about the user such as full name, email, and job title. The submission table stores basic information about the submission, similar to the report table. Further details about the submission are stored in the submission details table, which is also connected to the submission and user tables. The relationship between these tables is shown through the foreign keys that connect the detail tables with the main table and user table. Using sequence diagrams as the basis for creating class diagrams is not appropriate because sequence diagrams and class diagrams have different focuses and purposes in system design. Overall, a class diagram is sufficient for building a system because it provides a complete picture of the structure, attributes, and functions of the system elements, as well as how they relate to each other. Sequence diagrams are more optional and useful for analyzing specific communication flows, but are not required as a basis for designing the main structure of the system. In this class diagram, only three methods are used, namely create(), update() and read(). The class diagram does not use the delete() method, because this system is not intended to delete data.

Deployment Diagram

Deployment Diagrams provide an overview of the physical architecture of the software, hardware, and artifacts of the system. It can be thought of as the final representation of the use case scope, reflecting the physical form of the system. In contrast to the conceptual description of the interactions between users,

devices, and the system, Deployment Diagrams focus on the physical aspects and configuration of the system implementation. [16].

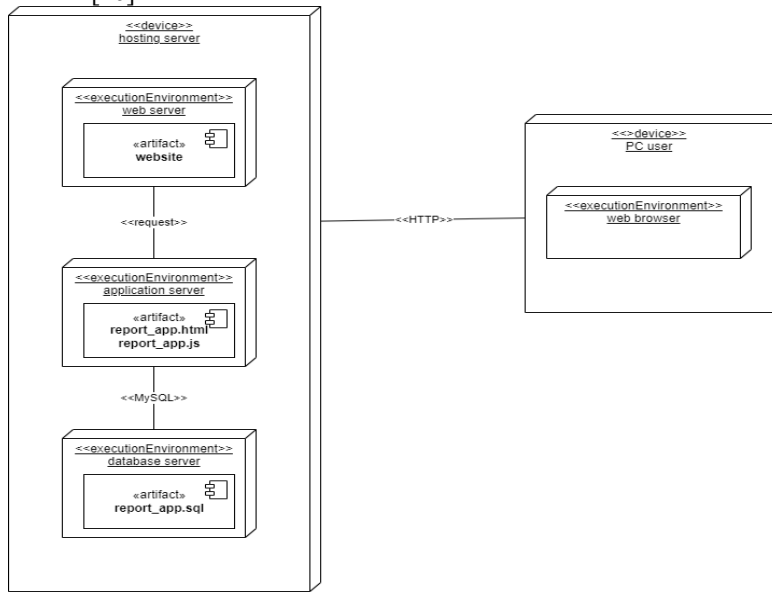


Figure 10. Deployment Diagram

In the picture above, it consists of two Nodes, namely the user PC Node and the Hosting server Node. The Hosting server Node consists of three Nodes, namely the web server Node which has a website entity, then the Application server Node has entities, report_app.html, report_app.js and the Database server Node has a .sql entity. for the web server and Application server Nodes are connected by requests, while for the Application server and Database server Nodes are connected by MySQL. In addition, there is a user PC Node which consists of a web browser Node. Where the user PC Node and Hosting server Node are connected by HTTP.

Architecture Diagram

Architectural diagram is a system architecture design stage that uses a program/subprogram architecture model known as architectural diagramming[17].

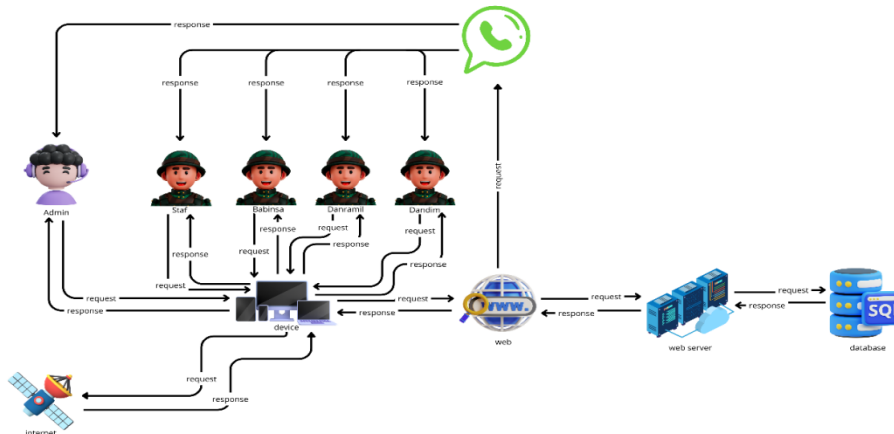


Figure 11. Architecture Diagram

From the picture above it can be explained that, users send requests through devices such as computers or smartphones that are connected to the internet. Then the user device sends the request to the web. Next, the request is sent to the web server, then the web server receives the request from the web and sends the request to the Database if needed. After that, the Database receives the request from the web server and processes it. Next, the Database sends the response back to the web server and the web server receives the response from the Database then sends the response back to the web, then the web receives the response from the

web server. The response from the web server is sent back to the device via an internet connection. The device receives the response from the web. In this explanation, the admin can also communicate with users both in sending requests and receiving responses from the device. In addition, requests from WhatsApp are forwarded to the Admin, and then the Admin will send a response to the user via WhatsApp.

Implementation

The image above is the user profile page. On this page, users can update their profile and change their password.

1. Report Form Page

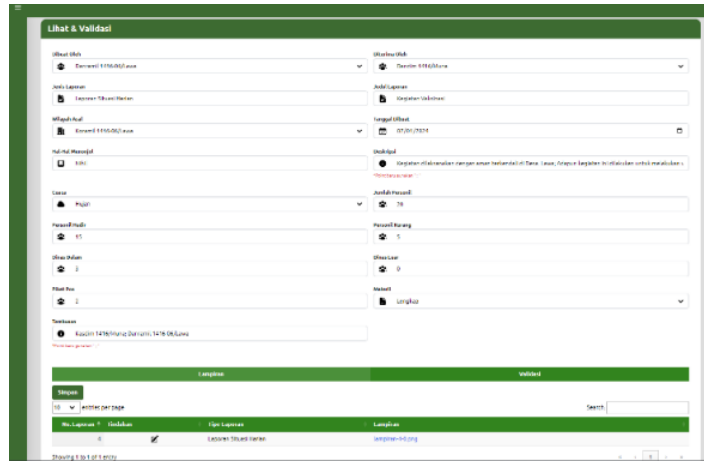


Figure 12. Report Form Page

The picture above is a form of making a Danramil report to the Dandim. This page only exists for Babinsa and Danramil users. It can be seen that the form for making reports from Babinsa to Danramil has differences with the form for making Danramil to Dandim. The difference is that in the form for making Babinsa to Danramil there are no columns for Number of Personnel, Personnel Present, Personnel Lacking, Internal Service, Outside Service and Post Picket.

2. Submission Letter Form Page

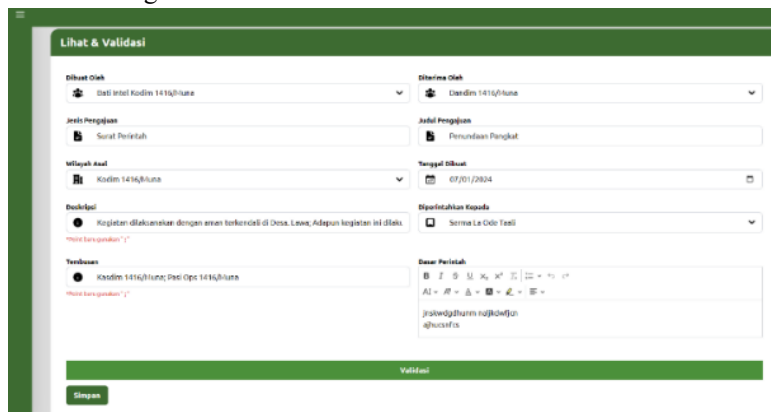


Figure 13. Submission Letter Form Page

The picture above is the form page on the submission letter maker. This page only exists for Staff users.

3. Notification WhatsApp Page

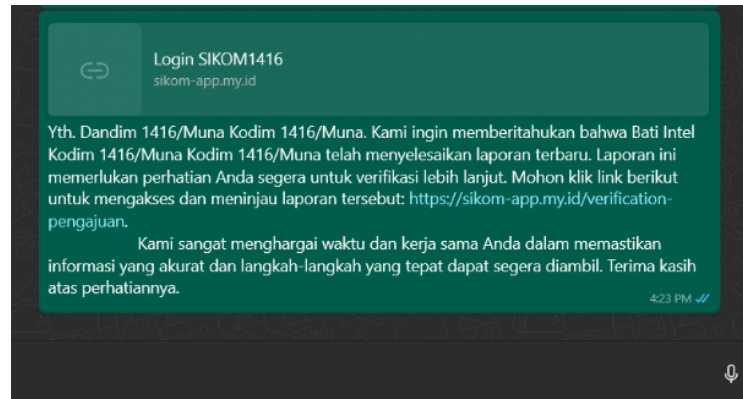


Figure 14. Notification WhatsApp Page

The image above is a WhatsApp-based notification sent to the intended user.

System Usability Scale

The System Usability Scale (SUS) is a questionnaire tool useful for assessing the extent to which a computer system is usable, focusing on the subjective views of users[18]. The System Usability Scale (SUS) is an easy way to test the extent to which a system is usable, using ten scales that provide an overall picture of the evaluation of usability goals[19].

Table 1. SUS Score Calculation Results

Respondents	Calculated Score										Total	Value (Total x 2.5)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
R1	3	2	4	3	3	3	2	3	3	4	30	75
R2	3	3	4	3	2	1	4	3	4	3	30	75
R3	4	3	3	4	4	2	3	4	4	3	34	85
R4	2	4	3	4	4	3	4	2	4	4	34	85
R5	4	4	2	4	3	3	4	4	3	3	34	85
R6	3	2	4	3	4	4	2	3	3	0	28	70
R7	4	3	4	2	2	1	4	4	2	3	29	73
R8	4	3	3	4	4	2	3	4	4	3	34	85
R9	3	3	4	4	3	3	4	2	4	4	34	85
R10	2	4	3	3	2	4	3	3	2	4	30	75
R11	3	4	4	3	3	4	2	3	3	4	33	83
R12	4	1	4	2	3	3	3	4	2	3	29	73
R13	3	3	3	4	4	2	3	4	4	3	33	83
R14	3	2	4	4	3	3	4	2	3	3	31	78
R15	2	4	4	3	4	4	3	3	2	4	33	83
R16	3	2	3	3	3	4	4	3	3	4	32	80
R17	3	3	4	2	4	1	3	4	2	3	29	73
R18	4	3	3	4	4	2	3	4	4	3	34	85
R19	3	4	4	4	3	3	4	2	4	3	34	85
R20	4	4	3	3	4	4	3	3	2	4	34	85
R21	3	2	4	3	3	2	4	3	3	4	31	78
R22	4	4	4	2	3	3	3	4	2	3	32	80
R23	4	3	3	4	4	2	3	4	4	3	34	85
R24	4	3	4	4	3	3	4	2	4	4	35	88
R25	4	4	3	3	4	4	3	3	4	4	36	90
Average Score (Final Result)												81

Table 2. Final Result Score SUS

System Usability Scale	Acceptability Ranges	Grade Score	Adjective Rating
81	Acceptable	A	Excellent

From the results of testing using SUS above, it can be concluded that the SUS score of 81 falls into the “Good performance” category. This indicates that users are satisfied with the usability of the website. Although the score of 81 indicates that the website has achieved good satisfaction, there are still opportunities to develop and improve the user experience with appropriate and continuous improvements.

User Acceptance Testing

Usage Test (UAT) is a testing process that aims to assess user responses to software that has been successfully developed [20]. User Acceptance Testing (UAT) is a test of the system after the development process, where the users of the system become testers. From the test, a document is produced as evidence that users accept the application development and consider that their needs have been met. [21].

This test was carried out by the last user, namely 10 representatives of Kodim 1416 / Muna members, by trying the system directly and filling out a questionnaire containing user acceptance testing questions. Based on the results of testing the features, it can be concluded that the information system of Kodim 1416/Muna has been successfully tested and meets expectations in terms of expected functionality. The existing features are able to support the daily reporting process and administration efficiently, as well as provide WhatsApp-based notifications to facilitate monitoring and evaluation.

CONCLUSION

Based on the results of the research that has been conducted, the information system designed for Kodim 1416/Muna shows satisfactory performance and is able to meet operational and administrative needs. However, to ensure the sustainability and improvement of the system quality, some suggestions can be given. The conclusions and suggestions are as follows:

Conclusions

1. The developed information system has successfully improved performance in the daily reporting and administration process at Kodim 1416/Muna. With WhatsApp-based notifications, leaders can monitor reports more quickly and on time.
2. The designed system has succeeded in reducing data duplication that previously occurred in the manual reporting method. Standardization of report formats and integration of information systems have helped in providing more accurate and reliable data.
3. Based on the SUS test results, users showed a high level of satisfaction with the usability of the information system. The score obtained falls into the “Good performance” category, indicating that this system has met user expectations.

Suggestions

1. To further improve efficiency and accuracy, it is recommended that the information system continue to be developed with additional features that can adapt to the growing needs in the field.
2. Despite the high level of satisfaction, it is important to ensure that all Kodim 1416/Muna personnel have adequate understanding and skills in using the new system.
3. To ensure that the information system is effective, it is recommended to conduct periodic evaluations of the system's performance and collect feedback from users on a regular basis.

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