



## DESIGNING A WEB-BASED ACTIVITY MANAGEMENT SYSTEM FOR ENHANCED DATA ANALYTICS PERFORMANCE

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### Abstract

Recording activities in an organization or institution is very important so that activities can run well, as well as recording activities related to worship activities. This research is motivated by problems in team, the study of mosques in Central Java, which currently does not have an information system in managing mosque activities and implementation data analytics for enhanced performance activity. The large number of activities in the place of worship and all activities have not been properly recorded and manual data processing makes it difficult for mosque administrators to process data and takes a long time. To overcome this problem, a management system is needed that can be easily accessed by mosque administrators and provides precise and accurate information about activities to the community. The research conducted in this final project is to create and design a web-based information system for mosques. Which information system is made with Hypertext Preprocessor (PHP), CodeIgniter Framework and MySQL database. The research method used is waterfall. Starting with system analysis, design, coding and the final stage is system testing. The purpose of the system design that will be made is to make it easier for mosque administrators to manage data on mosque activities and make it easier for the public to find information. And for users in submitting donations or activities, they don't need to come directly to the mosque because they can apply through the system.

**Keywords:** web, information system, data analytics

### INTRODUCTION

The development of technology is not a new thing in the modern era as it is today. It is undeniable that every year technology continues to grow and develop for the better, even the development of this technology has occurred since centuries ago. With the development of this technology provides many conveniences for its users around the world. And the most influential is the development of information and communication technology. However, in its daily life, the use of technology is still not fully utilized optimally by several agencies in managing their data, one of which is the Mosque at the research.

Data collection and application for activity permits are still carried out manually, because the process is still by the way the applicant for activities comes to the Mosque office with an application letter for an activity permit to be submitted and received by mosque officers. After the application letter was received, the mosque superintendent recorded the activity on the information board. With such an application flow, it is considered less effective because the applicant must come to the mosque in applying for an activity permit. And in delivering activity information is still using existing information boards, so that worshippers who want to know what activities will be held, must first come to the mosque. From the above problems, a system is needed that helps administrators in managing activity data and makes it easier to apply for activity permits and donations without having to come directly to the mosque.

This study aims to create a Web- Activities Information System at the mosque that can be used by administrators to facilitate users in submitting donations and requests for activities. This research is supported by several studies that have been conducted previously by researchers, including research from Alizi Ahmad in 2018 entitled "Design of a Web-Based Cash Overview Information System at the Miftahul Huda Mosque in Tangerang City" aimed at trying to design a web-based information

system. The method in designing and making this application uses the waterfall method and data collection techniques using observation, interview and literature study methods. This application is developed using PHP and JavaScript programming languages, HTML markup languages, CSS and MySQL as its database server. Then with this system, it is expected to make it easier for mosque administrators to manage an overview or summary of cash management and make it easier for worshippers and donors to find out transparent mosque cash information and can be accessed anytime and anywhere.

The second research conducted by Destiny Ambo and Kusuma Hati in 2019 with the title "Web-Based Cash Management Information System at Al.Madinah Mosque Tangerang" aims to facilitate mosque administrators in delivering cash in and cash out report information, to make it easier for mosque administrators to deliver mosque financial information to the community, to design a system that is easy to use and can collect data accurately (Ambo and Hati 2019). The information system designed contains position data, officer data, user data, cash in data, cash out data, print officer data and print cash data. While the tools used to build this system are using PHP programming language with MySQL databases. (Hartatik, Febriyanto, and Munawaroh 2018)

The research entitled "Web-Based Information System to Manage Licensing Data of Jeneponto Police Station of South Sulawesi Police" in 2017 by Natalis Ransi, La Surimi, et al was able to collect requests for permits and notification of opinions from the public. The information system built is web-based so that the use of this information system is expected to be easier to implement or develop for further needs. (Amarudin and Sofiandri 2018)

The latest research is Research from Hilda Amalia, Rima Ferdira and Maya Anggraini in 2017 entitled "Donation Fund Processing Information System" aims to build a web-based donor fund processing application which in its design can produce financial statements such as income and expenditure. (Ransi et al. 2017) In its design and research, the author uses 3 stages of research. Namely data collection by means of interviews and observations. Then the needs analysis is based on documents and interview results which will then be implemented, and the last stage is system design. In making applications, makers use PHP programming language and software used in creating databases, namely phpmyadmin. (Hartatik et al. 2018) (Sutarman 2012)

Judging from some of the results of the literature review review above, it can be concluded that previous research used methods or techniques, research objects and diverse results. However, there are some similarities in making the system, namely to make it easier for administrators to process financial data and in submitting activities. In this system, I use the CodeIgniter framework with a MySQL database. The purpose of the system to be created is to make it easier for administrators to manage their financial data and facilitate activity management. As well as making it easier for pilgrims to see activity information and financial reports. By submitting donations or submitting activities carried out in this system, the user does not have to come directly to the mosque.

## **LITERATURE REVIEW**

### **Information system**

A system is a collection/group of any physical or non-physical subsystems/components that are interconnected and work together harmoniously to achieve a specific goal. (Susanto, 2013). A system is a network of procedures created according to an integrated pattern to carry out the core activities of the company, while procedures are a sequence of clerical activities, usually involving several people in one or more departments, created to ensure the uniform handling of company transactions that occur repeatedly, (Mulyadi, 2010). Information Information is a collection of data that has been processed into a more useful and meaningful form for the recipient. Without information, a system will not run smoothly and may eventually fail. The source of information is data. Data describes a real-life event, which will be processed and applied into the system as input/information that is useful in the system. (Kristanto, 2018)

Information is data that has been processed into a more useful and meaningful form for the recipient, while data is the source of information that describes a real-life event. (Mulyanto, 2009). Information System An information system is a system that collects, processes, stores, analyzes, disseminates inputs, and produces outputs as information for a specific purpose to users or other systems. (Sutarman, 2012)

### **Data Source dan Data analytics**

According to Han, Kamber, and Pei (2012), data sources can be categorized into two types: internal data sources and external data sources. Internal data sources are data generated by the company itself, such as transaction data, customer data, and product data. External data sources are data that come from sources outside the company, such as market data, competitor data, and government data.

According to Provost and Fawcett (2013), data analytics is a process that consists of four stages: data collection, data processing, data analysis, and decision-making. The data collection stage involves collecting raw data from various sources, the data processing stage involves cleaning and organizing the data, the data analysis stage involves performing statistical analysis and data modeling, and the decision-making stage involves summarizing the analysis results and taking action.

### **METHOD**

The method used in making designing the Activities Information System is the waterfall method. The reason for using this method is because the waterfall method approaches systematically and sequentially in building a system. The following are the steps in the waterfall method:

#### **1. System Analysis**

At this stage the author collects data related to the contents of the financial management information system and the activities created, the definition of the required system, the explanation, and the purpose of the system obtained in consultation with system users. The analysis was carried out using interview methods and literature studies. Analysis of financial management information system needs and activities is carried out by considering several aspects, namely functional needs (activities or services formed by the system), non-functional needs (operational environment), user needs, and information needs.(Hartatik 2022)

#### **2. System Design**

After the analysis stage has been carried out, the next stage is the design draft. The design design is made based on the results of the needs analysis that has been obtained, starting from how the input, process to the results obtained. In this study, the design to be made is the design of Entity Relationship Diagram (ERD), Database, Activity Diagram and interface design (system display).(Amarudin and Sofiandri 2018)

#### **3. Data analytics**

A process of collecting, processing, interpreting, and visualizing data to extract useful information and make better organizational decisions. In the context of business, data analytics can help companies to accurately collect data through web-based information systems and identify trends, predict user behavior.

### **RESULTS AND DISCUSSION**

The design of an information system in activity management is necessary to improve data analysis, which is critical for data analysis needs in the era of big data. The concept of data analysis is currently required in various fields to improve team or organizational performance. Figure 1 illustrates the concept of improving data analysis quality through information systems.

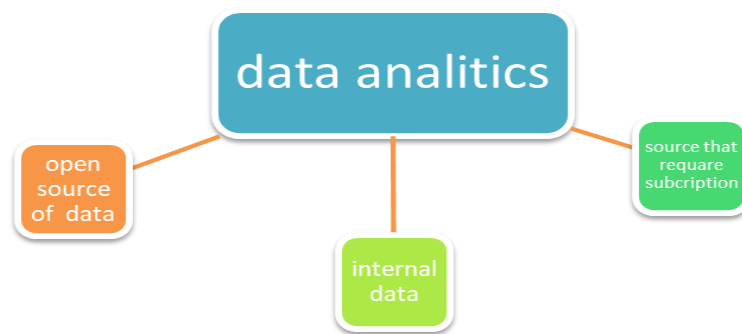


Figure 1. data analytics in information system

The business process that is carried out is that the administrator logs in, after successfully logging in, the administrator adds activity data. After the data is successfully added, the activity data will be visible in the activity list. Not only can it be inputted by the management, users from outside can also apply for activity permits. The business process that is carried out starts from the user registering an account, after that the user account is verified by the administrator to be active. If the account is already active, then the user can log in. After successfully logging in, the user can select the submit activity menu and fill in the activity data to be carried out including the application letter. Then the user waits for the activity submission data to be validated by the management and if the activity has been validated by the Mosque, then the user gets an email message notification. The business process of the information system for managing the activities of the Mosque can be seen in figure 2.

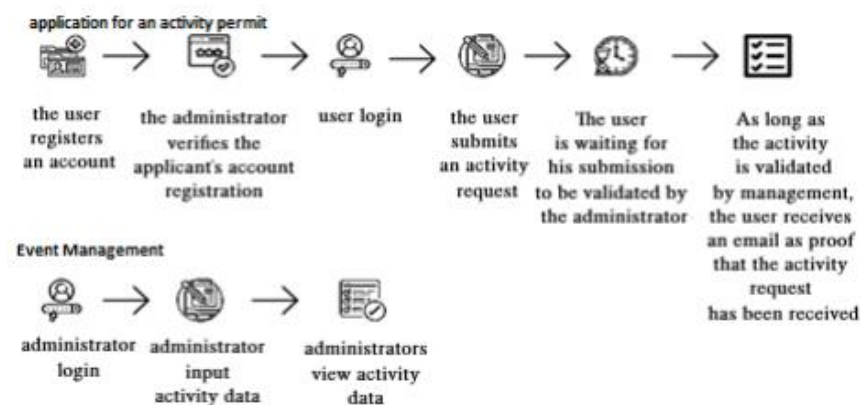


Figure 2. Business Process

In designing a database to make it easier to describe data that has relationships or relationships in the form of designs or diagrams using Entity Relationship Diagrams (ERD). The following is the ERD information system for managing activities at Mosque as shown in figure 3.

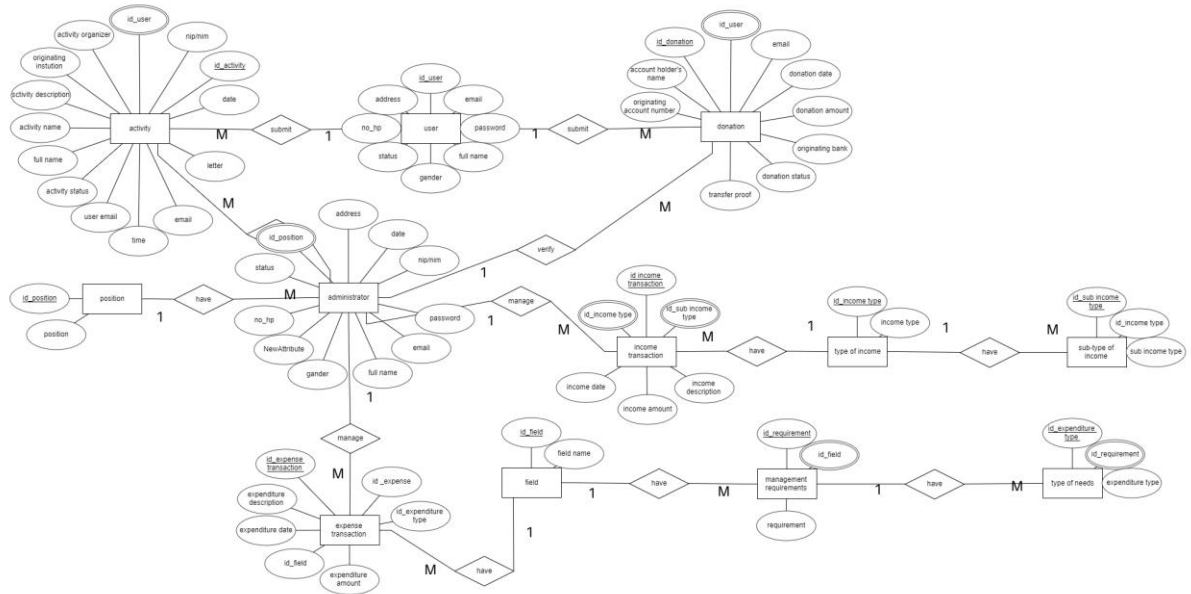


Figure 3. Entity Relationship Diagram (erd)

Usecase diagrams show the relationships of functions in the system as described in functional requirements. Usecase Diagram of Web-Based Activity Management Information System can be seen in figure 4, 5. There is an activity diagram to illustrate the work flow or activity of a system or business process in the software. This activity diagram illustrates a series of activity flows in both business processes and usecases. The following are some activity diagrams that exist in the planning of web-based activity management information systems.

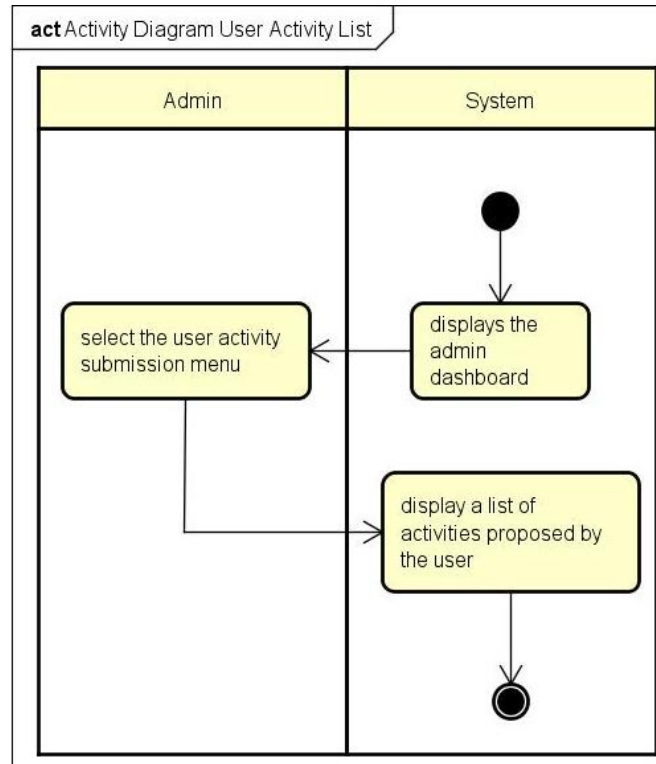


Figure 4. Activity Diagram User Activity List

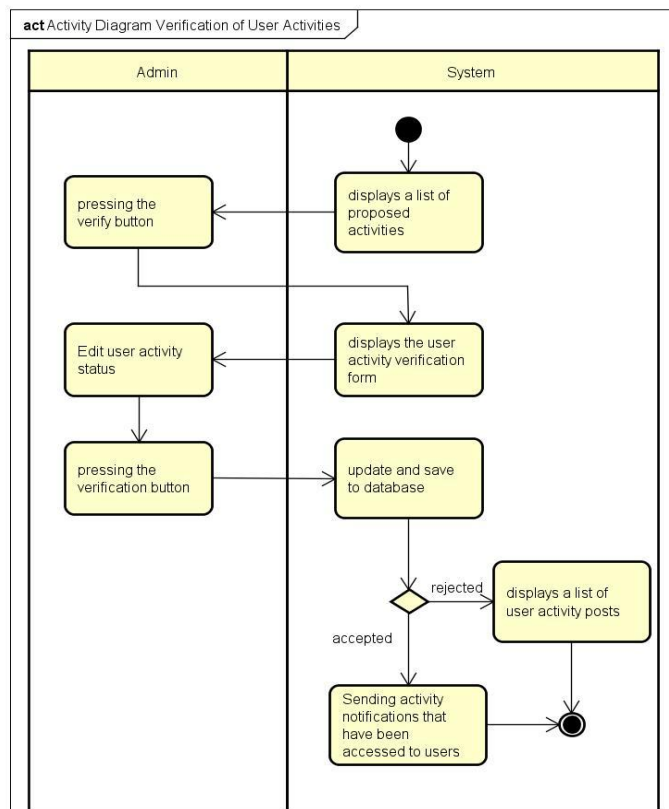


Figure 5. activity diagram verification of user activities

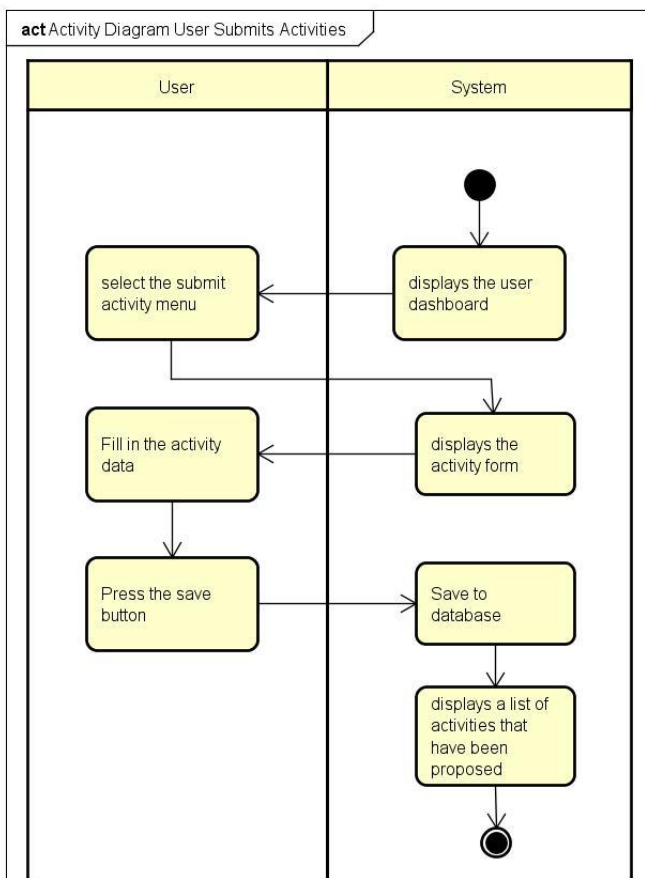


Figure 6. Activity Diagram User Submits Activities

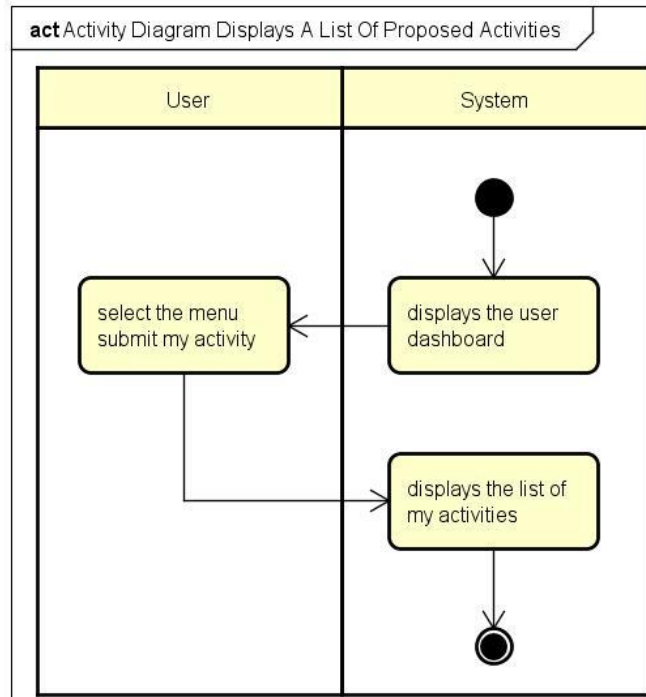


Figure 7. Activity Diagram Displays A List Of Proposed Activities

In the process of designing information systems, it is necessary to design a user interface to display the implementation of products to be created in the system. The following is the design of the user interface in the web-based activity management system at Mosque in Figure 6,7 and design of activity list and activity verification at Figure 8 -11 at below.

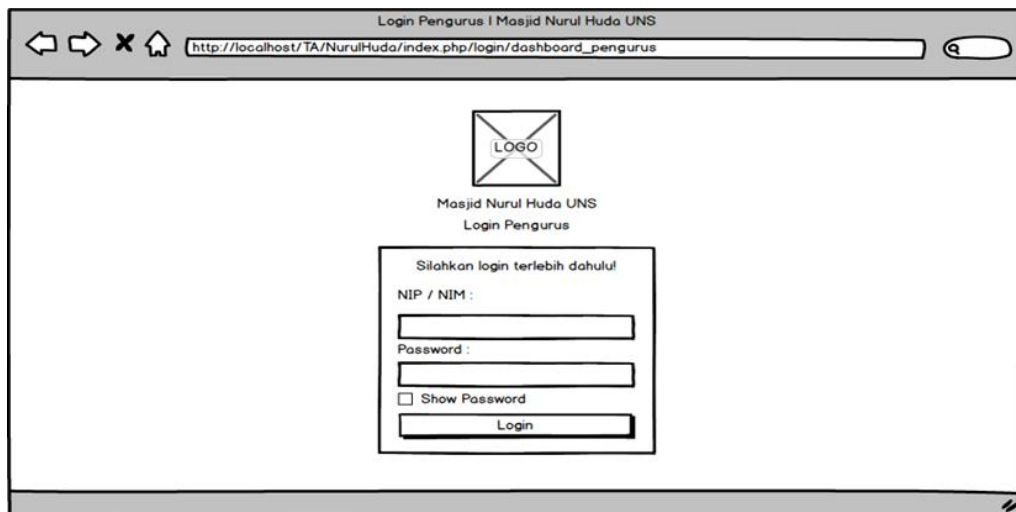


Figure 8. admin login page design

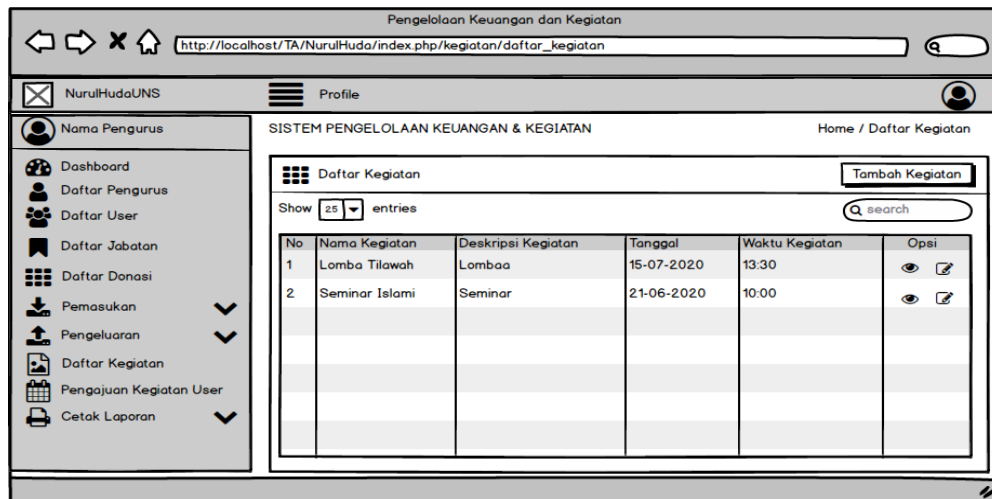


Figure 9. Designing The Activity List Page

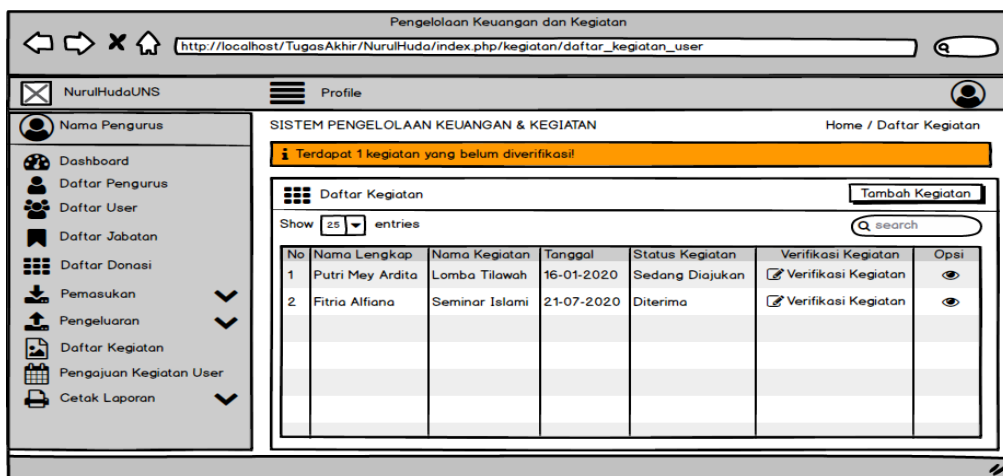


Figure 10. User Activity List Page Design

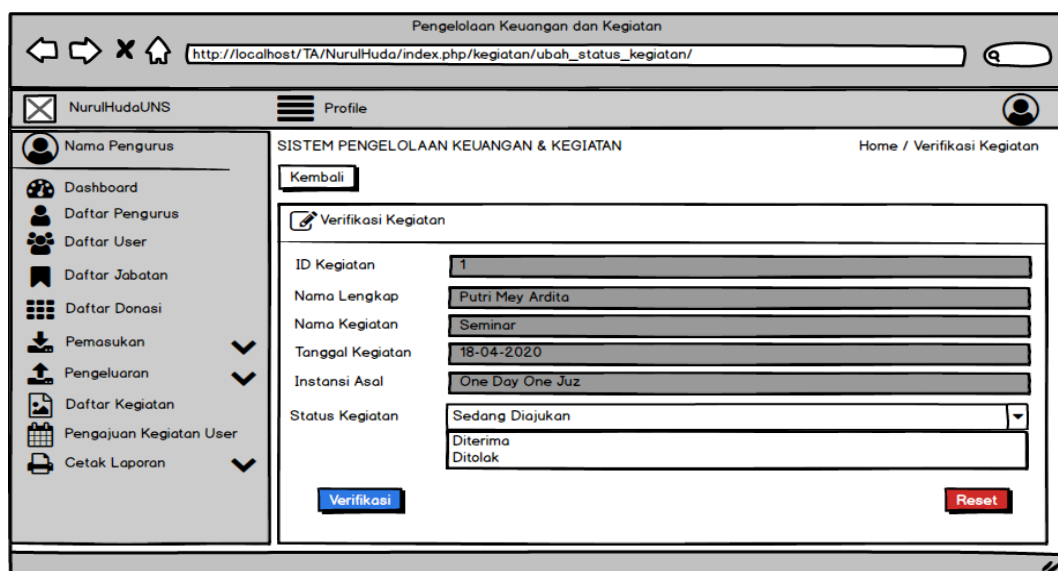


Figure 11. User Activity Verification Page Design

The design of this system test contains what is tested on the system. If the system is able to pass this test and the results are as expected, then the system is declared successful. The test design table

with the BlackBox method is used to test the Financial Management and Activities Information System at the Mosque.

Table 1. System Test Design

No	Tested Functionality	Scenario	Indicators
1.	Admins <i>sign in</i>	The management accesses the <i>home</i> page of the mosque, then presses the <i>Login</i> button – <i>Management Login</i> . Then the administrator enters the NIP/NIM and <i>password</i>	The system goes to the admin <i>dashboard</i> page.
2.	<i>User</i> registers	<i>Users</i> access the <i>home</i> page of mosque, then press the Registration button. Then the <i>user</i> fills in his data in the registration <i>form</i>	The system saves user registration data and enters the <i>user login</i> page.
3.	<i>User login</i>	User accesses the <i>home</i> page of mosque, then presses the <i>Login</i> button – <i>User Login</i> . Then the administrator enters the <i>email</i> and <i>password</i> .	The system goes to the <i>user dashboard</i> page.
4.	View a list of activities	The administrator selects the activity list menu.	The system displays a list of activities.
5.	Add activity data	The administrator presses the add activity button on the activity list page.	The system displays an activity <i>input form</i> and saves the activity data into a <i>database</i> .
6.	View activity details	The admin presses the details button on the activity list page.	The system displays detailed activity data.
7.	Edit activity data	The administrator presses the edit button on the activity list page.	The system displays an <i>edit form</i> and <i>updates</i> the data in the <i>database</i> .
8.	Delete activity data	The admin presses the delete button on the activity list page.	The system displays a data delete confirmation and deletes the data on the <i>database</i> .
9.	Display a list of <i>user</i> activities	The administrator selects the user activity submission menu.	The system displays a list of activities submitted by the <i>user</i> .
10.	View details of <i>user</i> activity	The administrator presses the details button on the <i>user's</i> to-do list page.	The system displays detailed <i>user</i> activity data.
11.	Verify <i>user</i> activity	The administrator presses the verification button on the <i>user's</i> activity list page.	The system displays a <i>verification form</i> and updates the status of data activities in the <i>database</i> .
12.	Propose an activity	<i>User</i> selects the submit activity menu.	The system displays an <i>activity input form</i> and saves the data into the <i>database</i> .
13.	View a list of proposed activities	<i>User</i> selects the activity submission menu	The system displays a list of activity submissions.
14.	View activity submission details	<i>The user</i> presses the details button on the activity submission list page.	The system displays detailed activity data.
15.	Edit an activity	<b>User</b> presses the edit button on the	The system displays an <i>edit</i>

	submission	activity submission list page.	<i>form</i> and <i>updates</i> the data in the <i>database</i> .
16.	Delete an activity submission	<i>The user</i> presses the delete button on the activity submission list page.	The system displays a delete confirmation and deletes the data on the <i>database</i> .
17.	View your list of activities	Worshippers choose the activity menu on the <i>home</i> page of the mosque.	The system displays a list of activities.

## CONCLUSION

The design of a web-based activity management information system at Mosque is a system design that is useful for designing a system to produce a system that can run according to user needs and improve activity performance in data analysis. The method used in the design of this system is the waterfall method because it is a method that approaches systematically and sequentially in designing of building a system.

## ACKNOWLEDGMENTS

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