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Designing a Web-Based Information System for Scholarship Management: Supporting Access and Rapid Dissemination of Information

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Abstrak- This abstract presents the design of a web-based information system aimed at enhancing the management of scholarships by facilitating quick access to information and efficient dissemination of relevant updates. Scholarships play a crucial role in providing financial assistance to students and enabling them to pursue quality education. However, the existing manual processes and fragmented information systems often lead to challenges in accessing scholarship details and timely dissemination of information. The proposed system addresses these challenges by leveraging web-based technologies and designing an integrated platform for efficient scholarship management. The system incorporates features such as a centralized database, user-friendly interface, and robust search functionality to enable seamless access to scholarship information. By adopting a web-based approach, the system ensures accessibility from various devices, including desktop computers, laptops, and mobile devices. Moreover, the system emphasizes the importance of fast information dissemination. It enables real-time updates and notifications to keep students, scholarship providers, and other stakeholders informed about application deadlines, eligibility criteria, and any changes in the scholarship programs. Additionally, the system allows for personalized notifications, ensuring that users receive relevant updates based on their preferences and areas of interest. The design of the web-based information system prioritizes security and privacy by implementing stringent authentication mechanisms and encrypted data transmission. It also incorporates features for efficient application submission, document management, and evaluation processes, streamlining the entire

scholarship lifecycle. The expected benefits of implementing this system include improved accessibility to scholarship opportunities, reduced administrative overhead, increased transparency in the selection process, and enhanced collaboration among scholarship providers and educational institutions. By leveraging the power of web technologies, the proposed system aims to revolutionize the management of scholarships, ultimately promoting equal educational opportunities and fostering academic excellence.

Keywords : Web-based information system, scholarship management, access to information, information dissemination, web technologies, application submission, transparency.

1. INTRODUCTION

The development of information technology, especially the internet, has had a significant impact on various aspects of human life [1] [2] . One area that has also experienced changes is the management of scholarships. Scholarships play an important role in providing students and students with financial access to pursue quality education [3] [4] . However, effective and efficient management of scholarships is a challenge in systems that still use manual processes and lack of information integration [5] .

In order to overcome these obstacles, the design of a web-based information system is the right solution. A web-based information system combines the advantages of internet and computing technology to provide fast access and efficient dissemination of information in scholarship management. By taking advantage of the advantages of web technology, this system can be accessed through various devices, such as desktop computers, laptops, and mobile devices [6] [7].

The design of a web-based information system for scholarship management aims to provide a better experience for users [8] . Through this system, scholarship information can be accessed easily and quickly by prospective scholarship recipients. A sophisticated search feature is also provided to make it easier for users to find scholarships that match their criteria. In addition, this system also pays attention to the speed of information dissemination, which allows users to get real-time updates on application deadlines, eligibility criteria, and other changes related to the scholarship program [9] . In addition to providing access and rapid dissemination of information, this system also places security and privacy as a priority. Equipped with a strict authentication mechanism and encrypted data transmission, this system ensures that users' personal data is safe from security threats [10] [11] .

It is hoped that the design of a web-based information system for the management of this scholarship will provide significant benefits. With easy access to scholarship information, more efficient administrative processes, and increased transparency in the selection process, it is hoped that equal educational opportunities will be created for all individuals. In addition, collaboration between scholarship providers and educational institutions can also be enhanced through this system, creating a more solid ecosystem in supporting academic excellence.

This introduction outlines the importance of designing a web-based information system for scholarship management that supports fast access and dissemination of information. In this research, we will discuss aspects of the design of the information system, including the architecture, main features, security, and the expected benefits of implementing this system .

2. RELATED WORKS

Related research on Web-Based Information System Design for Scholarship Management that supports fast access and dissemination of information has become an interesting topic for researchers in the field of information technology and education [12] . Several studies have been conducted to explore aspects related to the design of a web-based scholarship information system. The following are some related studies that can be used as references:

1. This study aims to design and implement a web-based information system that supports scholarship management. Researchers analyze user needs, identify important features, and develop systems that facilitate rapid access and dissemination of information [13] [14] .
2. This research focuses on designing a web-based scholarship information system specifically for higher education institutions. This system is designed to provide accurate and up-to-date scholarship information to students, simplify the application process, and enhance collaboration between educational institutions and scholarship providers.
3. This research focuses on security aspects in designing a web-based scholarship information system. Researchers identify security threats that may arise in scholarship management and develop strong security mechanisms to protect user data and scholarship information [15] .

4. This study evaluates user experience in using a web-based scholarship information system. Researchers conducted field research and data collection to assess the usability, reliability, and user satisfaction with the designed system [16] .
5. This study examines the impact of implementing a web-based scholarship information system on access to education. Researchers analyzed system user data, scholarship participation statistics, and success rates of scholarship recipients to evaluate the effectiveness of the system in increasing access to education [17] .

Website Introduction

Along with the development of technology and the internet, the website has become an important tool in various areas of life, including business, education, information, and many more. A website is a collection of linked web pages, usually accessed via a specific domain or URL. Websites can contain information, images, videos, applications, and interactions with users [18] [19] .

The website has an important role in providing information and presenting content to users online. They can be used for commercial purposes, such as selling products or services, or as a platform for sharing knowledge and information. The website can also function as a medium of communication, a place to interact with users through contact forms, comments or forums.

In making a website, there are several important elements that need attention. An attractive and responsive display design is very important so that users can easily navigate and access website content. Relevant and informative content must also be well presented, including text, images, videos and other interactive elements. In addition, website security is also an important concern, especially in protecting user data and preventing attacks from irresponsible parties [20] .

It is important to remember that creating a website is not only about visually appealing, but also about usability, functionality and a good user experience. A good website must be able to meet user needs, provide accurate information, and provide a satisfying interactive experience.

In today's digital era, having an effective and professional website can be a huge advantage in establishing a strong online presence and achieving desired goals. By designing and managing our website properly, we can create an engaging and meaningful online experience for our users.

In this related research, we will further explain the important role of the website itself, such as providing information and presenting content, and communication media [21] .

1. Providing Information

Websites can be used as a medium to present information about companies, products, services or certain topics. This information can be in the form of text, images, videos, brochures, or other documents that are relevant to user needs. By having an informative website, users can get the information they need quickly and easily.

2. Sharing Content

The website allows users to access and share content such as articles, blogs, news, tutorials, guides or other resources. These contents can be useful for users in gaining knowledge, solving problems, or exploring certain topics. By having quality and relevant content, the website can be a valuable source of information for users.

3. Communication media

Communication media refers to channels or means used to transmit messages or information between one party and another. Communication media plays an important role in facilitating the exchange of information, ideas and thoughts between individuals, groups, organizations or society in general.

Websites can be developed using various technologies and programming languages, such as HTML, CSS, JavaScript, PHP, and others. There are also platforms and content management systems (CMS) that make it easy to create and manage websites, such as WordPress, Joomla, and Drupal. In this related research, the programming language will also be explained as follows:

HTML

HTML (Hypertext Markup Language) is the standard markup language used to organize and present content on the World Wide Web. It is the foundation of the web page and is responsible for defining the structure and layout of the content. HTML uses a system of tags, which are located between angle brackets (< >), to define various elements and properties within a web page [22] .

CCS

CSS (Cascading Style Sheets) is a language used to set the appearance and style of elements on web pages. CSS serves as a separator between HTML content and its visual presentation, allowing web developers to control layout, color, typeface, and various other aspects of appearance [23] .

JavaScript

JavaScript is a programming language that is generally used to create interactivity on web pages. In the context of web development, JavaScript is used to control the dynamic behavior of page elements, such as form validation, animation, HTML element manipulation, data processing, and interaction with users through event handling.

JavaScript can be run on the client (browser) side and provides the ability to create more interactive and responsive web applications. With wide support across various browsers, JavaScript is becoming one of the most commonly used programming languages in web development [24] [25] .

PHP

PHP is a server-side programming language developed by programmer Rasmus Lerdorf in August-September 1994. PHP scripts run on web servers and are often referred to as server-side languages.

PHP has a syntax similar to the C programming language and provides various features and functions that facilitate the development of web applications [26] .

JQuery

JQuery is a JavaScript library or JavaScript library that provides ready-to-use code sets or listings. With JQuery, web developers can access and use pre-developed JavaScript features without the need to manually rewrite code. It facilitates web development by providing ready-to-use functions and speeds up the process of developing interactive and responsive web applications [27] .

API (Application Programming Interface)

API (Application Programming Interface) is a set of commands and functions provided by an operating system or software. This API is used by programmers to build software that can interact with the system. By using the API, programmers can take advantage of existing functionality without having to know the detailed implementation. API allows easier integration and interaction between applications and other systems [28] .

AJAX

AJAX is a web programming technique that creates interactive web applications. With AJAX, web pages can communicate with the server asynchronously, enabling dynamic updating of page content without needing to refresh the entire page [29] .

BOOTSTRAPS 5

Bootstrap 5 is a popular front-end framework for responsive web development. With Bootstrap 5, developers can easily create attractive and responsive interfaces with ready-to-use components and powerful CSS utilities [30] .

XAMPP

XAMPP is a software package containing Apache, MySQL, PHP, and Perl, which is used to easily create a local web server. This allows developers to test and develop web applications offline before publishing to a real server [31] .

3. METHOD

Research methodologies that can be used for case studies regarding improving the quality of scholarship data collection through an online approach and implementation of an integrated data collection system [32] could include the following steps:

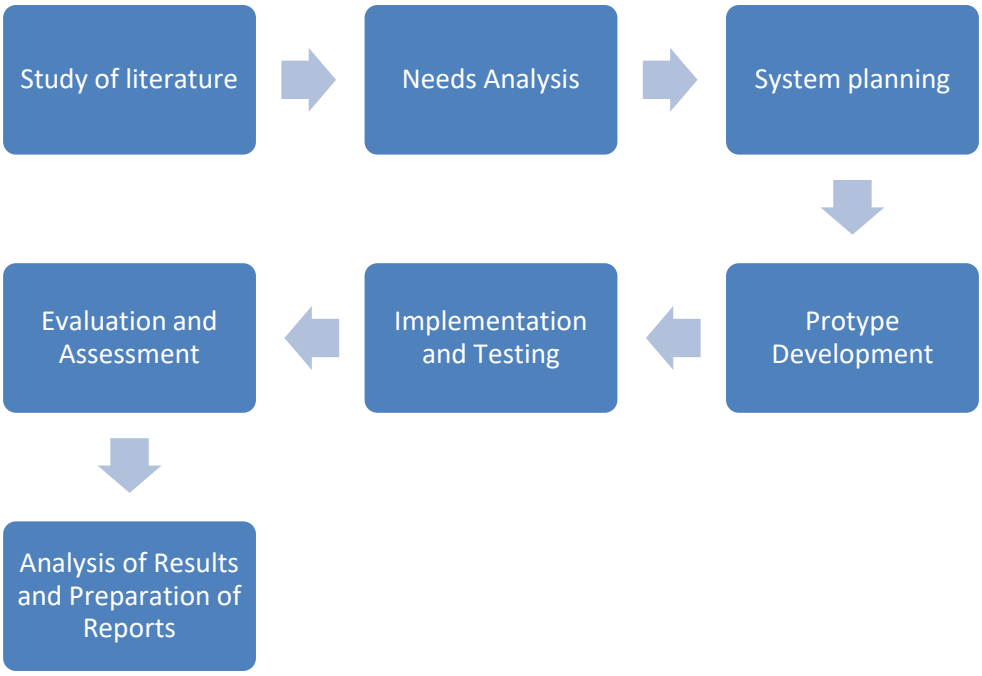

Figure 1. Propose Design Model

1. Literature Study: This stage involves a review of the relevant literature, including past research, scientific journals, articles, and related books. The goal is to gain an in-depth understanding of web-based scholarship information systems, user needs, problems that may arise, and solutions that have been proposed previously.
2. Needs Analysis: This stage involves collecting and analyzing user needs regarding the scholarship information system. Data collection can be done through interviews with related parties, surveys, or direct observation. This data is then analyzed to identify the functional and non-functional requirements that must be met by the system.
3. System Design: This stage involves designing a web-based scholarship information system based on identified needs. This includes user interface design, database design, system architecture and other technical specifications. This design must pay attention to aspects of access and rapid dissemination of information, security, scalability, and usability of the system.
4. Prototype Development: In this stage, a web-based scholarship information system prototype is developed based on the design that has been made. This prototype can be used to test and evaluate the main functions of the system, get feedback from users, and make necessary improvements.

5. Implementation and Testing: This stage involves implementing a final web-based scholarship information system based on the designs and prototypes that have been developed. After implementation, the system is thoroughly tested to ensure that its functionality and security conform to predetermined requirements.
6. Evaluation and Assessment: This stage involves evaluating the performance of the web-based scholarship information system that has been implemented. Evaluation can involve the use of functional testing, security testing, performance testing, and gathering feedback from users regarding their usability and satisfaction with the system.
7. Analysis of Results and Preparation of Reports: The last stage involves analysis of the results of testing and evaluation, as well as preparation of a research report that presents findings, conclusions and recommendations regarding the design of a web-based scholarship information system for scholarship management that supports rapid access and dissemination of information.

4. RESULT AND DISCUSSION

To support the research results, data collection activities are carried out through interview activities, documentation, and literature review. Multiple analysis steps carried out as a form of follow-up to the results of data collection activities, including Formulate analysis results PIECES .

1. Doing system design with UML: *use cases, activities, classes, andsequences diagram.*

Study This aim For designing And make system information scholarships that can help students and officers in registering scholarships on an *online basis* . As for the method development system in planning system information scholarship This using the *Waterfall method.* with the stages of its implementation as in Figure 2 .

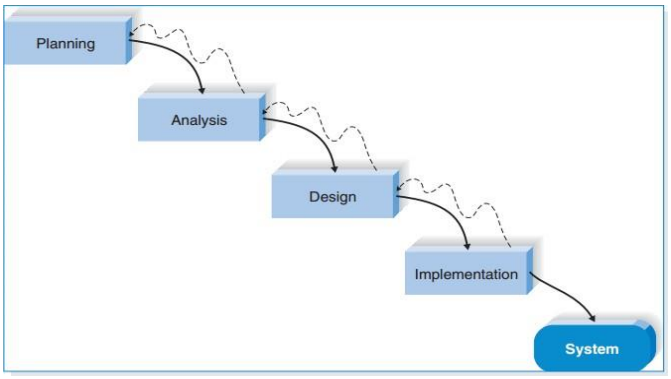

Figure 2: Waterfall Method

Analysis PIECES

For identify problem, must done analysis to performance, information, economics, application security, efficiency, and service to other parts related. From the results of this analysis obtained various suggestions to help the system more Good.

- **Website Design and Website Design**

System design involves several important components. First, the Context Diagram provides an overview of the system process flow and interactions with external entities. Furthermore, Data Flow Diagrams (DFD) are used to model the flow of data in the system. Use Case Diagrams identify system functions and interactions with users or other actors. Entity Relationship Diagram (ERD) designs the structure of entities, attributes, and relationships in the database. Finally, making a website display prototype helps in designing a visual design according to user needs. System implementation involves coding based on the designs that have been made. System design is important to ensure the suitability of the system with the needs and objectives previously set [33] . .

Context Diagram

Context Diagram is a visual representation that shows the relationship between the main system and external entities. It helps describe how the system interacts with its environment, such as users, hardware, and other systems. These diagrams help in understanding the system environment, identifying interacting external entities, and setting system boundaries.

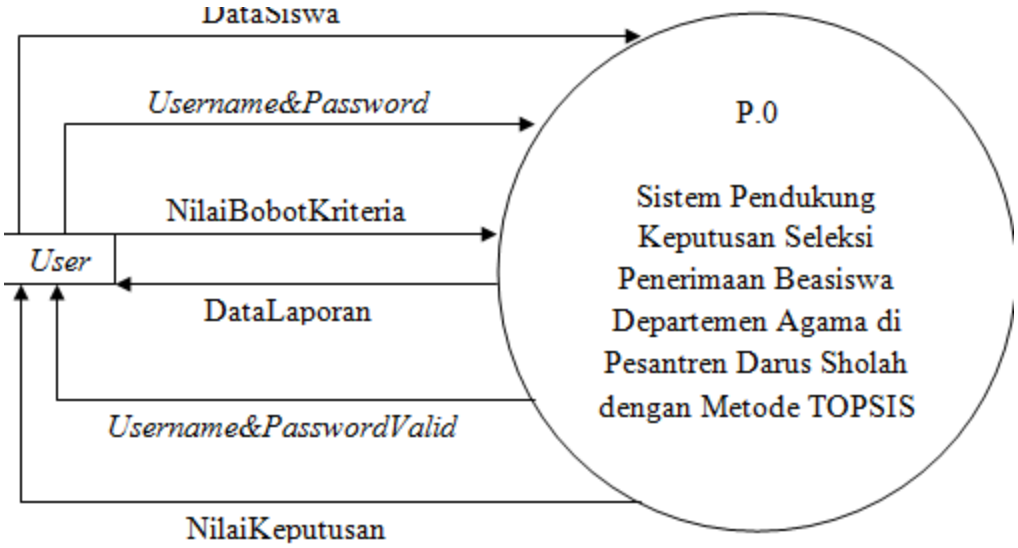

Figure 3 Context Diagram

DFD (Data Flow Diagrams)

Data Flow Diagram (DFD) is a modeling method used to describe the flow of data in information systems. DFD uses the main components, namely processes, data flows, external entities, and data storage [34] . Process describes the activities or actions that occur on data, while data flow indicates the movement of data between processes, external entities, and data stores. The external entity represents the external source or destination of the data flow, while the data store represents the place where the data is stored in the system. DFD assists in understanding how data moves within the system, identifying the processes involved, and showing the relationships between processes, external entities, and data stores. DFD is often used in systems analysis and design to describe the business logic and interactions between system components. In designing this website there are dfd levels that can be made, as follows:

1. **DFD LEVEL 1**

   Level 1 diagrams document diagram contextbecome more detail. On DAD level 1 there are 5 processes, namely process login , enter student data, enter data weight criteria, manipulation data, And calculation matrix decisionwith Method TOPSIS.

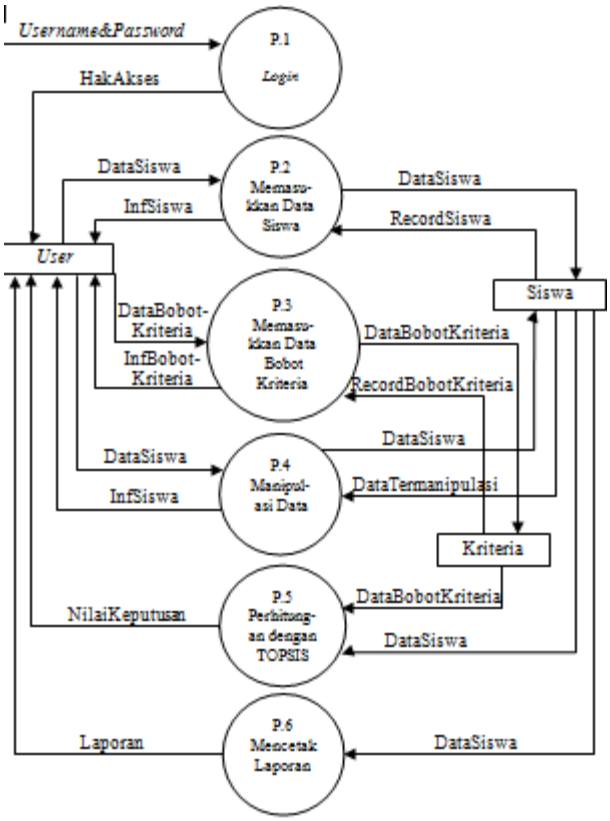

Figure 4 DFD Level 1

2. DFD Level 2

Of the 5 DFD level 1, there are 1 process that can be broken down into some part of the level 2 DFD process that is, manipulation data can seen on picture

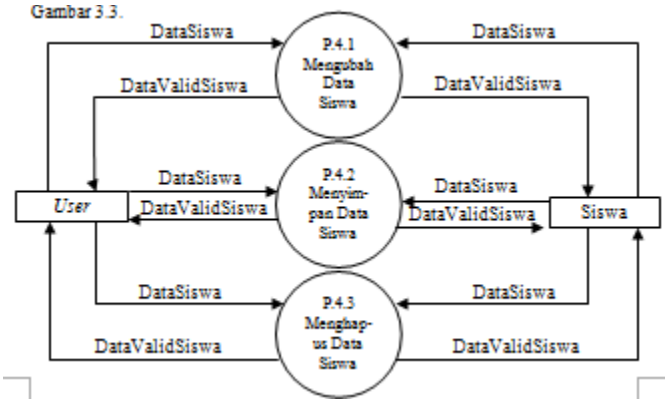

Figure 5 DFD Level 2

Entity Relationship Diagram (ERD)

Entity-Relationship Diagram (ERD) is a visual representation of the relationship between tables (entities) in a database. ERD is used to design and understand the structure and relationships of

data. In ERD, entities represent tables in a database, whereas relationships describe how the entities are connected to one another , such as one-to-one, one-to-many, or many-to-many. There is also a primary key which is a unique attribute to identify each entity, as well as a foreign key which refers to the primary key of another table. ERD assists in the database design process, facilitates communication between stakeholders, and serves as a database schema documentation [35] .

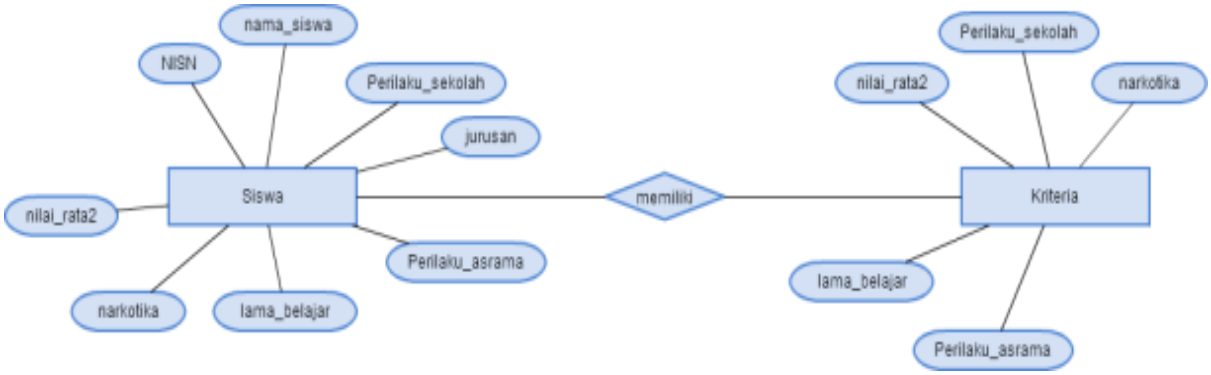

Figure 6 Entity Relationship Diagrams

Use cases Diagram

A Use Case Diagram is a graphical representation that describes the interactions between actors (users) and the system being analyzed or designed. Actors (users) in this diagram represent external entities that interact with the system, while use cases represent the functions or actions that can be performed by users within the system. Use case diagrams help visualize the main goals of the system and the interactions between users and the system. Use case describes A interaction between One or more actor with system information Which will made [36] . Usecase diagram can seen in Figure 7

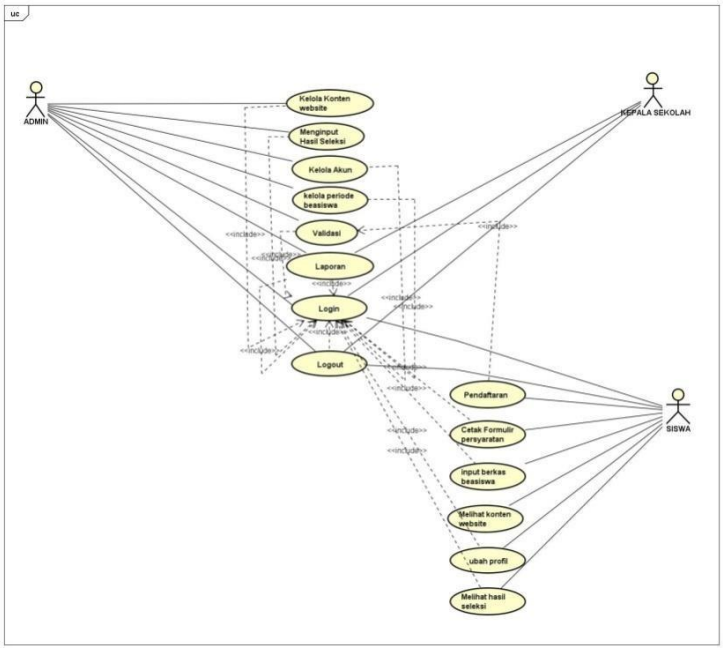

Figure 7 System design using use case diagrams

Include is used when one use case requires functionality from another use case to complete an action or workflow. In this case, the included use case will be executed as part of the use case that requires it. Use cases that require cannot function properly without included use cases, and included use cases will only be executed if certain conditions are met in the use cases that require them [37] .

Meanwhile, Extend is used when there are optional or alternative scenarios that can be added to the main use case. The main use case can function independently without the extended use case. Extended use cases will be executed only if certain conditions are met or if the user selects an additional path. Extended use cases provide additional flexibility and optionality in the workflow or actions that occur within the main use case [38] .

Activity Diagrams

Activity diagrams on a website are a visual representation of workflows or processes that occur on a website. This diagram maps out the steps or activities carried out by the user or system in interacting with the website. In website activity diagrams, each activity is represented by graphic symbols such as rectangles or circles with links that describe the flow from one activity to another [39] .

These diagrams help in visually understanding how users interact with the website, the steps to be taken, the flow of information and the response expected from the website. Using activity diagrams, web designers and developers can identify areas for improvement, optimize the user experience, and improve process efficiency within websites. Activity diagramcan seen in Figure 8.

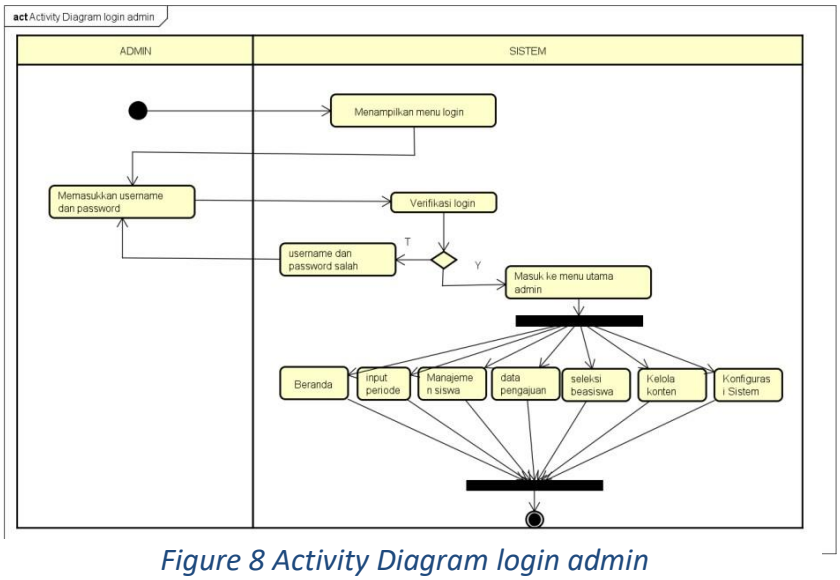

Figure 8 Activity Diagram login admin

System Which has analyzed And designed in a manner detail And has selected, furthermore system can implemented (applied). Implementation is the stage where the designs that have been made before are coded with Language programming certain For become A application. Stage This Also included in the activity of doing program coding. The following shows the program Which Ready implemented:

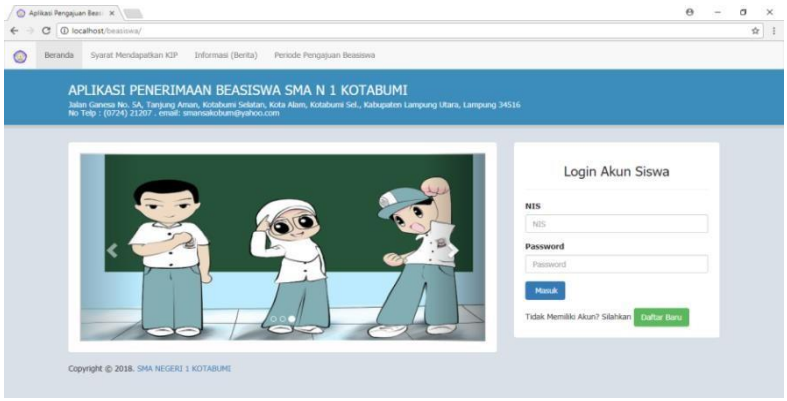

Figure 9 Display of the Login Page

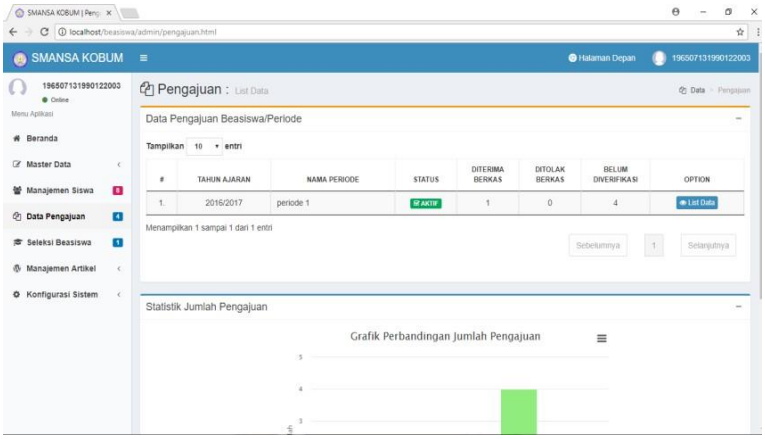

Figure 9 Display scholar ship

5. CONCLUSION

In order to support access and rapid dissemination of information in scholarship management, the design of a web-based information system plays an important role. Through this system, users can easily access scholarship-related information, view requirements, and apply efficiently. The web-based information system also enables real-time information dissemination, providing updates on application deadlines, changes to criteria, and other important information.

In this study, we identified several key factors that need to be considered in designing a web-based scholarship information system. The speed of access and dissemination of information is a top priority to provide a good user experience. In addition, data security is also an important factor, so the protection of users' personal data must be guaranteed through an authentication mechanism and secure data transmission.

Suggestion:

Based on this research, there are several suggestions that can be given for further development in designing a web-based scholarship information system that supports fast access and dissemination of information:

1. Periodic Updates: The scholarship information system needs to get regular updates to keep up with technological developments and user needs. This could include increasing the speed of access, adding more sophisticated search features, and integration with other communication platforms.
2. Use of the Latest Technology: In designing a scholarship information system, it is important to consider the use of the latest technology, such as artificial intelligence, data

analytics, and integration with social media platforms. This will enrich the user experience and increase effectiveness in information dissemination.

3. Collaboration between Educational Institutions and Scholarship Providers: The design of a web-based scholarship information system should encourage closer collaboration between educational institutions and scholarship providers. This could include more efficient exchange of data, improved communication between the two parties, and real-time updates on available scholarship opportunities.
4. Evaluation of User Experience: Evaluation of user experience is an important step in designing a scholarship information system. Conducting surveys, testing functionality and gathering user feedback will help improve the system and increase user satisfaction.
5. Security Awareness : In managing user personal data, scholarship information systems must pay attention to data security aspects. Implementing strict security protocols, data encryption, and strong authentication mechanisms will help maintain the confidentiality and integrity of user information . .

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