DEVELOPMENT OF A WEB-BASED NEW STUDENT ADMISSION INFORMATION SYSTEM

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ABSTRACT

Admission of new students is a routine activity carried out by schools every new school year. This activity aims to advance the school so that in its implementation a selection is needed. This selection is carried out in order to achieve a target of achieving the quality of prospective students. In this new student admission, a committee is needed to facilitate the activity. Currently, not many schools in Indonesia have implemented an online admission system. The purpose of this research is to design a web-based new student admission information system "SIPSB" and facilitate the registration of prospective new students to be more efficient. In designing this new student admission information system, the Object Oriented Analysis and Design (OOAD) method and the waterfall model are used. The use of the waterfall model in this study makes it easier for researchers to design information systems because there are several stages in system development, namely requirements analysis, system design, implementation, system testing, and maintenance. The results of this study show that the new student admission information system "SIPSB" is able to manage the web-based new student admission process more efficiently.

Keywords: Information System; UML; Web

1. Introduction

New student admission is one of the important processes in educational institutions such as schools. This process is carried out every year to screen prospective students who will be accepted. This activity aims to advance the performance of the school so that in its implementation a selection is needed. This selection is carried out in order to achieve a target of achieving the quality of prospective students. In this new student admission, a committee arrangement is needed to facilitate these activities [1].

System development can be interpreted as the process of assembling a new system to replace the old system as a whole or improve the existing system. Quoted from [ALB05] with the title “Analysis and Design of Information Systems” argues that, a system is a network of interconnected procedures, gathered together to carry out activities or complete a specific goal [2]. Meanwhile, according to Gordon.B.Davis (1985), which is also quoted from the book [ALB05], information is data that has been processed into a form that is more meaningful and more useful for recipients to make current and future decisions. So the information system defined by [ALB05] is a set of organisational procedures that when implemented will provide information for decision makers or to control the organization [3].

Based on this definition, in today's digital era, a web-based new student admission information system is an effective and efficient solution. This system allows prospective students to carry out the registration process independently via the internet or intranet network. The purpose of the new student admission information system is to provide accurate and reliable information to prospective students and improve school performance in terms of new student admissions [4].

Such a system has the potential to produce a more efficient and systematic process. In addition, this system also improves administrative processes and data, making it more efficient in terms of time, place, energy, and cost. Manual form filling using sheets provided by the committee makes it difficult for the committee to read the forms filled in by applicants.

The high level of interest shown by potential applicants to apply to an institution may create difficulties for admissions officers, so, although the number of active commissions is limited, applicants may gather during peak recruitment periods. In addition, it takes time to prepare application forms for selection at admission and there is a possibility that disclosure to applicants will be delayed. In this case, since each school conducts the selection process at the same time, it becomes difficult for applicants who have not been selected to find another school of their choice.
With the development of an online-based New Student Admission Information System (SIPSB), it is hoped that it will make the implementation of new student admission selection more transparent and schools can also reduce fraud that occurs in the implementation of manual new student admission selection [5].

2. Materials and Methods

a. Research Methods

The Software Development Method uses the waterfall model development method. In waterfall there are several main stages that describe software development activities. The reason for using the waterfall method is because the stages in system development in the waterfall model are clearly structured [6].

![Figure 1. Waterfall Methods](image)

1) Needs Analysis

Requirements analysis is the process of discovering, refining, modelling, and specifying the needs of a new system or product or product change. The needs analysis process must also pay attention to changing needs during the analysis process. This is because new stakeholders may change the business environment. Therefore, the requirements analysis process must pay attention to consistency and conflicts with other requirements [7].

a) Functional Requirements
   - The new student admission information system must be able to receive input from users in the form of text or images.
   - The new student admission information system must be able to process real-time data submissions.

b) Non-Functional Requirements
   - The new student admission information system must be able to handle registration requests.
   - The system must be accessible during the estimated time specified.

c) Business Requirements
   - The system must reduce operational costs by 20%.
   - The system should increase revenue by 15%.
   - The system must be able to reduce production time by 30%.

d) User Needs
   - The system must be easy to use by inexperienced users.
   - The system should be able to display relevant information quickly.
   - The system should be accessible through mobile devices.

e) Environmental Needs
   - A system that is easily accessible to prospective new students, providing accurate information, etc.
   - Availability and security of user data.
   - Completeness of features in the new student admission information system.
   - Users may need software that is fast and easy to use, and can be accessed from mobile phones.
   - Needs assessment is conducted to ensure that the needs identified actually fulfil the needs of the applicants.

2) System Design

The design process is a multi-step process that focuses on four characteristics, namely data structure, software architecture, user interface visualisation, and process details. The design is prepared after conducting a thorough requirement analysis.

3) Implementation

Making programmes or design results into certain programming languages. Writing the programme code in accordance with the predetermined design, resulting in a useful application.

4) System Testing

System testing is the process of executing a programme with the aim of finding damage or errors in the programme. System testing is carried out to ensure that the resulting product can meet user needs and expectations, and is error-free.
5) Maintenance
Apply the integrated system and perform maintenance or repair if there is an error.

b. Research Model
The research methodology serves as a guide in conducting research so that the results obtained do not deviate from the previously achieved goals. The OOAD method can be divided into two main steps, namely: Object Oriented Analysis at this stage identifies the purpose of the application or system and the system needs or information needs arising from these objectives. In particular, this step describes the problems encountered in adapting new students, communicating the student data obtained and presenting the flow chart of the current and future systems.

Object Oriented Design at this stage is carried out to design the processes that will occur in the system including application design at this stage, the author uses the Unified Modelling Language (UML) as a tool. Database Designer at this design stage, using Activity Diagram, Use Case, Class Diagram, Sequence Diagram as tools [8].

The OOAD method is used to solve problems by thinking about a problem in a new way. This method helps in identifying objects involved in the system, relationships between objects, and object behaviour. In OOAD, analysis and design are done simultaneously and iteratively. This method is very useful in object-based software development [9].

3. Results
a. Home Screen
On the home screen, a menu of options will be displayed in the information system, including Academic Calendar, About Us and Login.

![Home Screen](image)

Figure 2. Home

b. Academic Calendar
On the academic calendar screen, the system can display the agenda of events that will, are or have taken place.

![Academic Calendar](image)

Figure 3. Academic Calendar
c. About Us
In the About Us view, there is a brief introduction from the development team of the Web-based New Student Admission Information System (SIPSBB).

![Figure 4. About Us](image)

![Figure 5. Login Admin](image)

d. Login Page
To be able to register and select new students, the admin or registrar first logs in on this page.
1) Admin
2) Prospective students

![Prospective Students](image1)

Figure 6. Prospective Students

e. Register Page
If you do not have an account, register first on this page.

![Register Page](image2)

Figure 7. Register Page

f. Registration Form Page
The registration form page is used by prospective students to complete their personal data so that it can be used as a determinant in selection.

![Registration Form Page](image3)

Figure 8. Registration Form Page

g. Proof of Registration
When you open the proof of registration page, but have never filled in the data and register, a notification will appear as shown in Figure 9. When you have registered, it will appear as shown in Figure 10.
Figure 9. Proof of Registration (Before)

Figure 10. Proof of Registration (After)
h. Announcement
The announcement page will display the results of the new student admission selection to prospective students.

![Figure 11. Announcement](image1.png)

i. Profile Page
On this page, the admin or prospective student's personal data will be displayed.

1) Admin
Admin can verify after checking data from prospective students

![Figure 12. Profile Admin](image2.png)
2) Prospective Students

After the announcement of passing the selection, prospective students can print their personal data to be used later during re-registration.

![SIPSB Dashboard](image1)

**Figure 13. Prospective Students Profile**

j. Registration

Prospective students access the web and the system displays the main page. Prospective students will then register and the system displays the registration form. After that, prospective students fill in their personal data to create an account and save it. If the data is complete, the account creation will be confirmed, but if not the process of filling in the personal data will be repeated.

In creating an account, prospective students determine the username and password. After the registration process is successful, prospective students log in and start filling out forms and uploading files. If there is an error, the officer can edit the data then the admin will verify the data.

The results of data verification will be displayed on the system and prospective students and guardians can access the announcement then the system displays the announcement of the prospective student's registration. After being declared passed, prospective students can print the personal data that has been uploaded to the system which will then be collected at the time of re-registration. Apart from the features previously described, there is also an academic calendar feature that can be accessed to monitor the time and activities that will be carried out by officers and prospective students.

k. Activity Diagram

Activity diagrams explain the various actions or activities that occur in a system, including actions performed by objects, as well as the sequence and dependencies between these activities.

The following is a picture of the activity diagram of SIPS.
Figure 14. Activity Diagram

Figure 15. Use Case Diagram

1. Use Case Diagram
4. Discussion

There have been many studies on new student admission information systems, including one entitled "Design of New Student Registration Information System at Makassar High School Based on Website". This research designs a website-based new student registration information system at Makassar High School. The development method used is the Waterfall Model, with MySQL as the database and PHP and HTML as the main programming languages. This research aims to improve efficiency and effectiveness in the process of registering new students [10].

The research entitled "Web-based New Student Admission Information System at Junior High School 43 Palembang". This research discusses the development of a web-based new student admission information system at a junior high school in Palembang [11].

The research entitled "Development of a Web-based New Student Admission Information System". Although it does not specifically mention new student admissions, this research discusses the development of a web-based new student admission information system [12].
The research entitled "Designing a Web-Based New Student Admission Information System (Case Study: SMP Plus Babussalam Bandung)" also does not explicitly refer to new student admissions, but discusses the development of a web-based new student admission information system [13].

The research entitled "Development of a Web-based New Student Admission Information System at SMA 1 Annuqayah Sumenep" aims to overcome the problem of data loss and store automatic student data in the web-based new student admission system at SMA 1 Annuqayah Sumenep [14].

Based on the results of previous research, the new Student Admission Information System developed in this study proved to be more effective and efficient. This system can help schools improve the process of admitting new students and produce more qualified prospective students.

5. Conclusions

This Web-based New Student Registration Information System (SIPSB) has been developed from several previous information systems. This system is designed to be used by schools that need information systems in new student admissions. In addition, this system is expected to be able to manage the implementation of new student admissions more effectively, and with this new student registration system, new student registration becomes easier and more efficient.

References