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Information System for Internship Applications in the Yogyakarta City Communication, Informatics, and Encoding Office

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ABSTRACT

The Office of Communication, Informatics and Encoding (DISKOMINFOSAN) is a Yogyakarta City government agency tasked with carrying out government affairs in the field of Communication, Informatics and Encoding to meet the needs of society in the current digital era. Needs regarding registration and internship activities or field work practices for Yogyakarta City students, DISKOMINFOSAN is needed to provide better service. Based on the data obtained from interviews with the Sub Coordinator of the Information System Planning and Implementation Substance Group explained that the apprentice registration system and apprentice activities that are currently running are not computerized so that the data cannot be managed optimally. Research is also carried out by direct observation as an active participant in internship activities so that it can analyze deficiencies and constraints on the running system. In the early stages, students must submit documents for the requirements to register for an apprenticeship directly to the agency so that it will take time. Next, students fill in the required data on the Google Form. If an internship has been accepted, students must fill in the progress and final report on the Google Form. This activity is considered inefficient for students because they have to access many Google Form links during registration and internship activities. The software development method used in this study is the Waterfall method, the framework used for application development uses the CodeIgniter framework while the software testing used is the black-box method. With the design of this website application system, it can be a solution to problems that occur in the running system for the registration process and internship activities at the Yogyakarta City Informatics and Encryption Communication Service.

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INTRODUCTION

The Office of Communication, Informatics, and Encoding is a regional device that functions to provide services to the community related to information and data technology services (Kuncoro & Fauzi, 2022). The task of the Office of Communication, Informatics and Encoding is to assist the Mayor in carrying out government affairs and the assignment of special affairs in the fields of communication and information, coding, and statistics. The Office of Communication, Informatics and Encoding (DISKOMINFOSAN) is one of the government-owned agencies in Yogyakarta City. The agency was formed based on Yogyakarta City Regional Regulation Number 5 of 2016 concerning the Establishment and Composition of Yogyakarta City

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Regional Apparatus and Mayor Regulation Number 79 of 2016 concerning the organizational structure, position, duties, functions, and work procedures of the Communication, Informatics and Encoding Agency of Yogyakarta City. The establishment of DISKOMINFOSAN is a merger between the Public Relations and Information Section of the Yogyakarta City Secretariat, the Information Technology and Telematics Section, and the Management of Coding in the General Section of the Yogyakarta City Secretariat. The task of DISKOMINFOSAN is to carry out the duties of regional government affairs based on the principles of autonomy and assistance in the fields of communication, informatics, coding, and statistics. The Diskominfo organization consists of the Head of Service, Subdivision of Administration, Information and Statistics Division, Public Communication Division, Technology and Informatics Division, and Coding and Telecommunications Division. Rusidi argues that, internships are part of the curriculum that every final semester student must undergo as a step to prepare themselves to become a professional workforce and ready to work (Azwar, 2019). So that DISKOMINFOSAN Yogyakarta City receives many internship applications from students of various universities, and also provides various kinds of internship vacancies that can be done by internship students.

It's just that registration activities and finding information about internship vacancies still use conventional methods, namely students still have to come to the agency to get information about internships at the time provided by the agency, which is very time consuming, especially when students come outside the specified time due to ignorance so they don't get any information. Students who have received information about internship vacancies and are declared accepted register by sending an internship application letter from the campus and given to the secretariat, then students are asked to fill out a registration form via google form to fill in personal data. Not only that, during the internship activities, students are asked to fill out a google form to report on the progress that has been achieved during the internship activities, until at the end of the internship, students are also asked to submit an internship report using google form. The above activities are really inefficient for students because they have to access many google form links during registration and activities, and it is possible for the agency to lose student files that have sent applications that occur due to slipping or damage.

From the observations that have been made previously, the authors decided to create a website-based application that can provide information about internship vacancies, register, to input progress reports and final reports during internship activities at DISKOMINFOSAN Yogyakarta City so that all student data is not easily scattered and lost by the agency, and students have no difficulty finding information about internships so that they can register easily and can be done anywhere. The agency can also easily receive data on students who have registered to check the internship reports that have been sent by their internship students.

RESEARCH METHOD

The research methods used to obtain accurate data for this information system design research include:

1. Data Collection Method
   To design an Information System, data is needed to create a system that can meet user needs. The research methodology used in designing this Information System is:

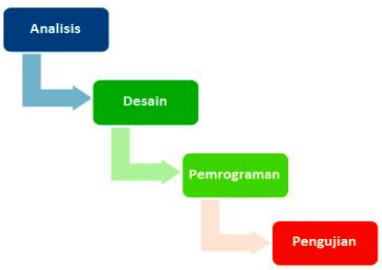
a. Interview
   The interview method is carried out with sources or agency parties, namely the Sub-Coordinator of the Information System Planning and Implementation Substance Group as well as mentors or supervisors of internship activities. From the results of the interviews that have been carried out, data is obtained, namely regarding the problems that occur in the current system by users in the Yogyakarta City Informatics and Communication Office apprenticeship system.

b. Observation
   The observation method is done by directly observing the current system. The observation was carried out by being an active participant as an intern at the Yogyakarta City Informatics and Communication Office for 3 months. From the observations made, there are several problems that occur in the internship registration process and internship activities when students have been accepted for internships. In the registration process, students must provide the required documents directly by coming to the agency and then filling out the google form. After the student is accepted, the student must fill in the progress and final report on the google form link. The process is considered to be less effective and efficient because students have to access many google form links.

2. Descriptive qualitative method is a research method in which the data obtained from the observations and interviews above are also not in the form of symbols and numbers where the data is data that is taken into consideration for the design of information systems.
3. Descriptive qualitative research methods generally use purposive sampling, snowball sampling, or convenience sampling to collect data. Each method has different objectives and approaches in selecting appropriate samples for research.
4. Software Development Methods
   In designing this Internship Information System (SI AMANG) application, researchers used a waterfall approach. The waterfall method is a software development method that is carried out systematically or sequentially. Each stage has different parts and objectives so that the previous

stage must be fulfilled before proceeding to the next stage. In this method, customers are actively involved in the development stage, especially in analyzing needs and designing the system. This helps the customer to clarify the specifications of the desired requirements to the developer. This method is suitable for classifying and detailing initial requirements, and allows effective cooperation between customers and developers to ensure that the system developed is in accordance with the final objectives that have been set. The following are the stages of the waterfall development method used by the author as many as 4 stages as follows:

a. Analysis
   At this stage the designer makes observations and interviews with DISKOMINFOSAN to get the necessary data. The data obtained is then processed and analyzed so that information is obtained about the specifications of customer needs for the system to be designed.
b. Design
   After the data at the needs analysis stage is processed and analyzed, the next step is the design stage. At this stage, the results of the information data obtained are then designed in detail. The design includes system architecture planning, component structure, user interface design, and database design. The purpose of the design stage is to produce clear guidelines on how the system will be built and interact with other components. A detailed and detailed design will be the basis for the next implementation stage.
c. Implementation
   The next stage is implementation (programming). At this stage, the previously created system design will be implemented into executable code. The development team will build system components in accordance with the design that has been designed, produce working program code and integrate the components into a complete system.
d. Testing
   The next stage that is done is software testing, where the software that has been implemented is then tested to determine whether the software is functioning properly and meets the predetermined requirements. testing can be functional testing. performance and security. At this testing stage, what will be done is to use Black box testing.



Source: (Baihaqi et al., 2020)

Figure 1. Waterfall method

RESULTS AND DISCUSSION

To overcome the problems that occur in the internship system of DISKOMINFOSAN Yogyakarta City, an internship information system application is needed that can provide convenience for agencies and students in carrying out internship activities.

The following is the ongoing student internship business process at DISKOMINFOSAN Yogyakarta:

1. Searching for information about internship vacancies still uses conventional methods, namely students still have to come to the agency to get information about internships at the time provided by the agency, it is very time consuming, especially when students come outside the specified time due to ignorance so they don't get any information.
2. Internship registration is still conventional, students who are declared accepted register by sending an internship application letter from the campus and given to the secretariat, then students are asked to fill out a registration form via google form to fill in personal data.
3. Data management of both weekly internship progress and final reports still uses google form, students are asked to fill out google form to report on the progress that has been achieved during the internship activities, until at the end of the internship, students are also asked to submit internship reports using google form.

From the flow of existing business processes, the stages are carried out to design the required system in accordance with the waterfall method. The following are the stages used by the author in designing the internship application information system, namely as follows:

1. **Software Requirements Analysis**
   Before building the system, it is necessary to determine in advance who will be the actors in the system and what the actors can do in the system to be built. Therefore, the actors or users needed in this system are Admin, Students and Mentors. Here are the Admin requirements: (a) Can login, (b) Change internship information, (c) Manage the internship field, (d) Manage internship vacancy category data, (e) Managing internship mentors, (f) Manage internship registration, (g) Manage student guidance schedules, (h) Receive student internship progress, (i) View internship attendance, (j) Manage student internship reports.
   Student needs: (a) View internship information, (b) Create an account, (c) Applying for an internship, (d) Login, (e) View selection results (accepted or not accepted), (f) View the guidance schedule, (g) Manage internship progress, (h) Taking attendance, (i) Make an internship report, (j) Conduct discussions with mentors according to their category, (k) Download grades and internship completion certificate.
   Mentor needs: (a) Mentors can login, (b) View internship registrations according to their category,

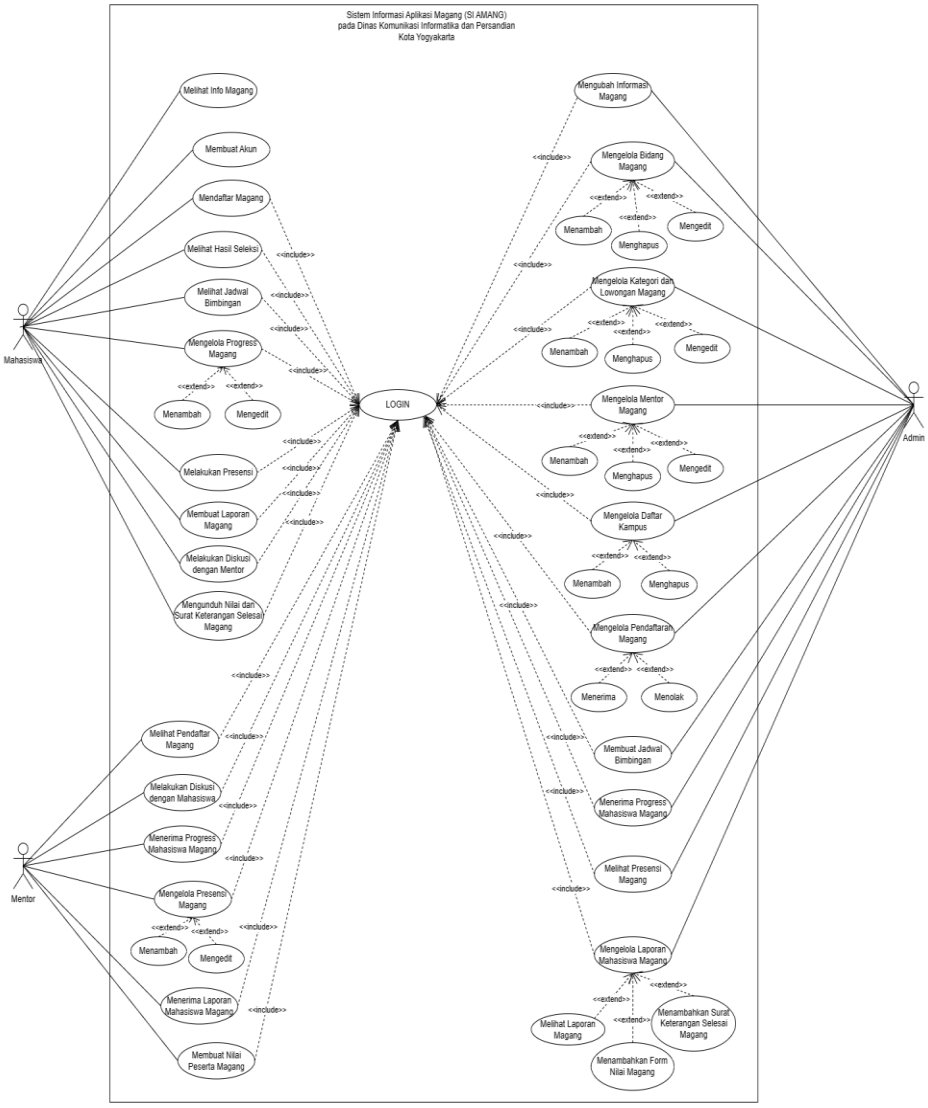
(c) Conduct discussions with students according to their category, (d) Receive student's internship progress according to their category, (e) Manage internship attendance according to category, (f) Receive student internship reports according to their category, (g) Grade apprentices according to their category.

2. Design

At this stage there are two types of designs, namely System design or design can be done if the system analysis stage has been completed. This system design is made to make it easier for developers to design a system to suit their needs. Unified Modeling Language (UML) is a standard specification language for documenting, specifying and creating software systems (Nuraeni & Astuti, 2019). According to Permana, several Unified Modeling Language (UML) diagrams as a tool in system analysis to describe the business processes that are running on the system and to describe the concept of the new system being developed, where the new system can certainly provide solutions to existing problems and system requirements (Sarasati et al., 2021). With UML, system analysts can describe the system in a more structured and organized way, making it easier to understand and develop software systems. The following are the diagrams used in UML:

a) Use Case Diagram

According to Pratama, a use case diagram is a graphical representation of some or all of the actors, use cases, and interactions between them that make up a system. Use case diagrams do not explain how use cases are used, they only briefly describe the relationship between use cases, actors, and systems (Kurniawan et al., 2020). Based on the SI AMANG application that was built, it can be described with a use case diagram with a fish-level model involving three actors, namely admin, mentor, and student with each access right can be described in Figure 2 as follows:



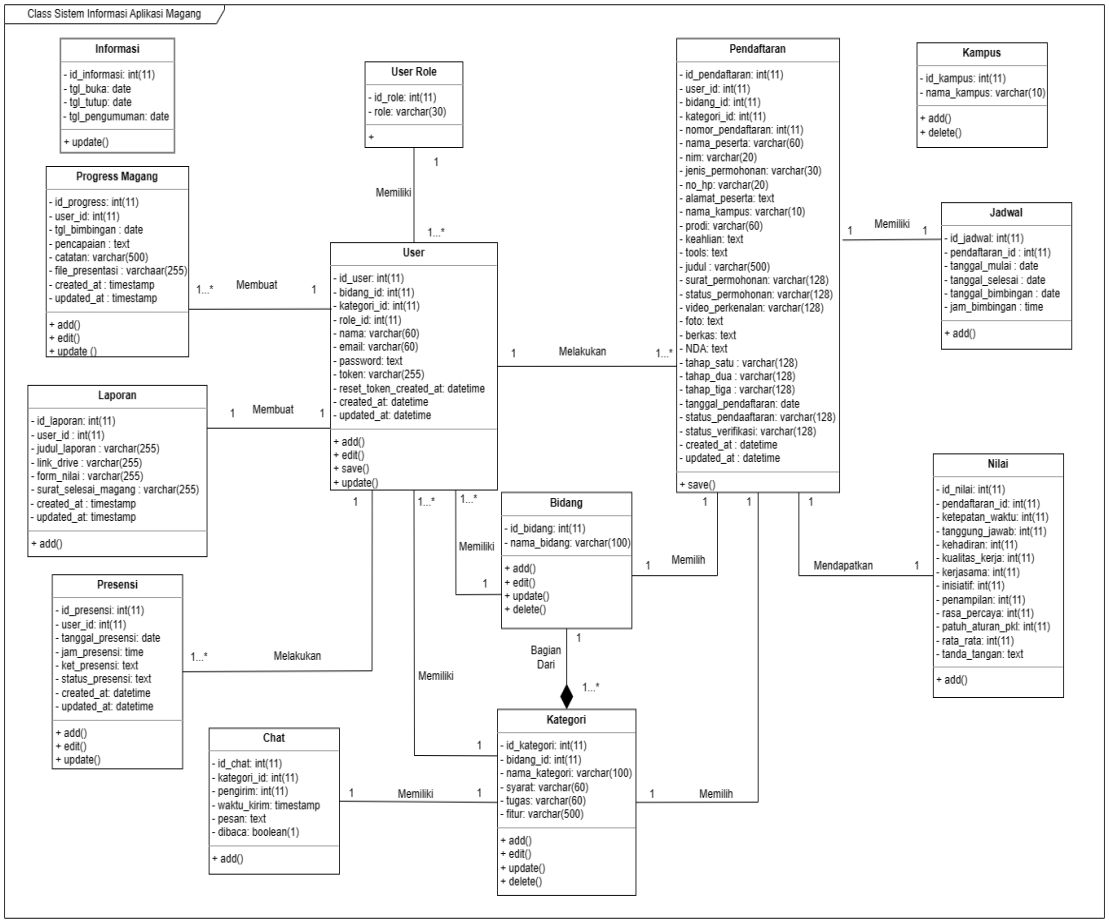
Source: (Pradana et al., 2023)

Figure 2. Use Case Diagram

In the use case diagram of the SI AMANG application, there are three actors used, namely Students, Mentors, and Admin. Students can view internship information, create accounts, register for internships, view internship selection results, view mentoring schedules, manage internship progress, take attendance, create final internship reports, conduct discussions with mentors, and download internship grades and internship completion letters. Mentors can view internship registrants, conduct discussions with students, receive student internship progress, manage internship attendance, receive student internship final reports, and create internship grades. While the admin has the task of changing internship information, managing internship fields, managing internship categories and vacancies, managing internship mentors, managing campus lists, managing internship registration, creating internship guidance schedules, receiving student internship progress, viewing internship attendance, and managing student internship final reports.

b) Class Diagram

Class diagram is one of the most important UML diagrams that describes the class or object design of a system (Abdulghani & Gozali, 2019). UML class diagrams are represented with a box, a class is a specification that if instantiated will produce objects and is the core of object-oriented development and design. Classes describe the state (attributes/properties) of a system providing services to manipulate that state (methods/functions) (Nuraeni & Astuti, 2019). Class diagrams allow developers to visualize and design class structures in a more structured and systematic way. Class diagrams can also help in understanding and communication between development teams in software development. The following figure illustrates the class diagram of the SI AMANG application:



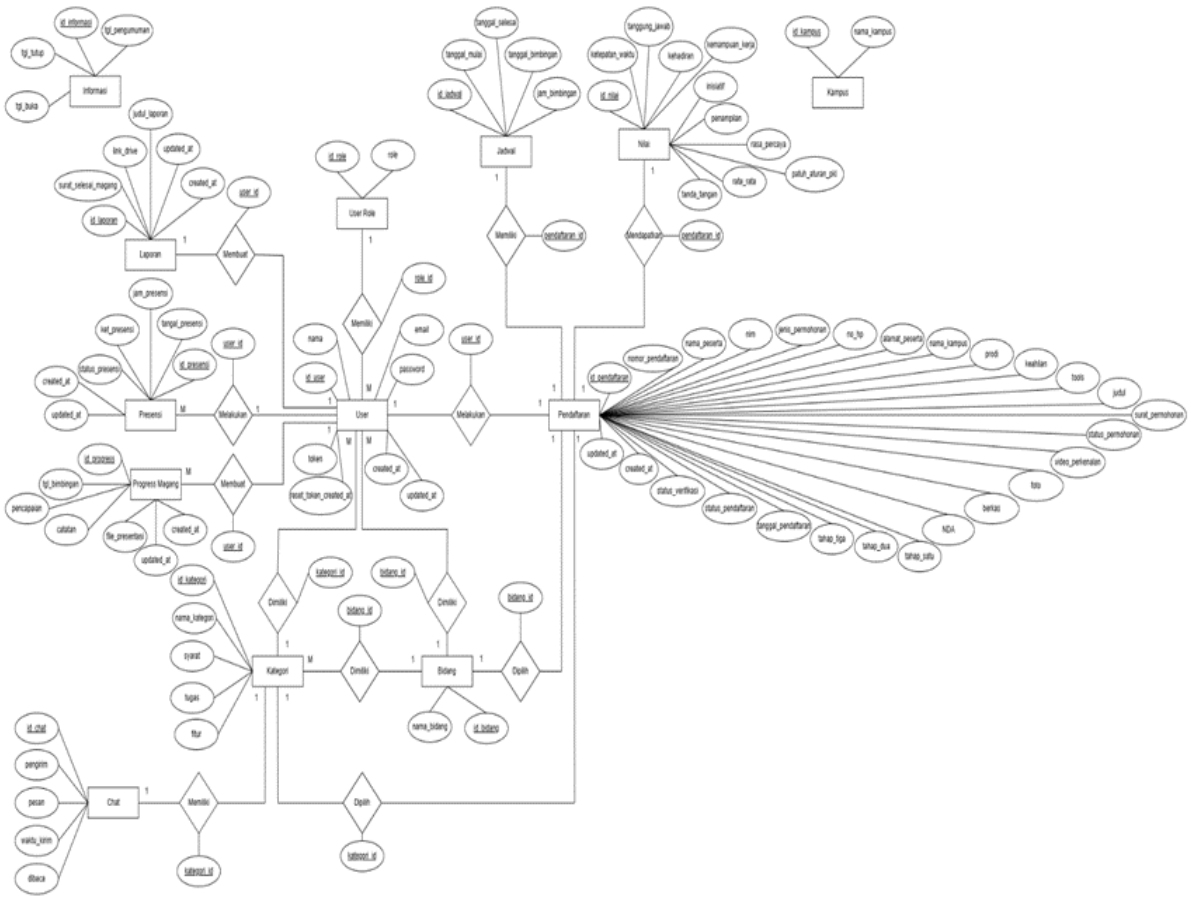
Source: (Pradana et al., 2023)

Figure 3. Class Diagram

c) Database Design

Database design is the stage or process of designing files in the database, which is a place to record inputted data and a place to return the value of the data that has been inputted. Entity Relationship Diagram (ERD) is a way to describe a database using symbols and relationships between these symbols (Situngkir et al., 2020). ERD is also a representation of the relationships between objects in the real world, often referred to as relationships

between entities (Maruloh et al., 2021). ERDs allow developers to visually and logically model the relationships between these objects, making database design, deployment, and management easier. The following figure 4 illustrates the ERD design of the SI AMANG application:



Source: (Pradana et al., 2023)

Entity Relationship Diagram

3. Implementation

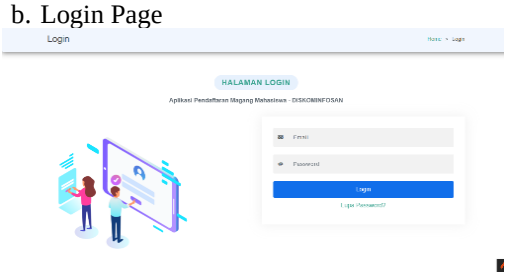
This system design is implemented with the Mysql DBMS application and the CodeIgniter 4 framework, this application is web-based using the PHP and javascript programming languages. There are several sections of the user page based on their role, namely Admin, Mentor and Student. The following is a view of the SI AMANG website that is used by the user.

a. Home Page

Source: (Pradana et al., 2023)

Figure 5. Main Page

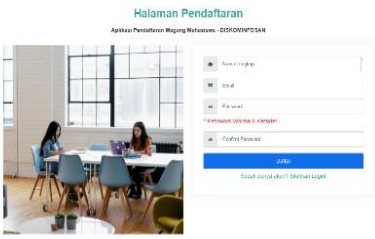
b. Login Page



Source: (Pradana et al., 2023)

Figure 6. Login Page

c. Account List Page



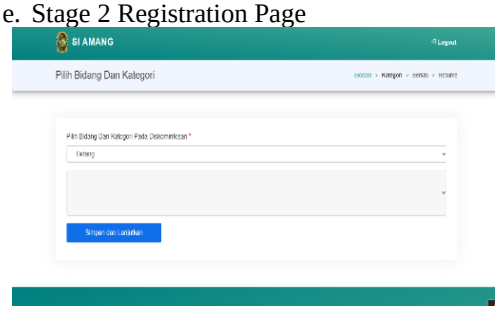
Source: (Pradana et al., 2023)

Figure 7. Create Account

d. Stage 1 Registration Page

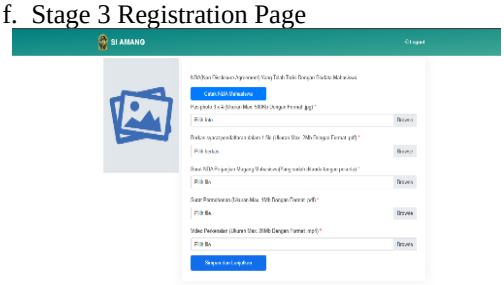
Source: (Pradana et al., 2023)
Figure 8. Stage 1 Registration Form

e. Stage 2 Registration Page



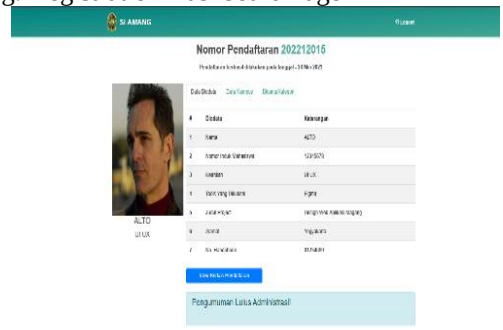
Source: (Pradana et al., 2023)
Figure 9. Stage 2 Registration Form

f. Stage 3 Registration Page



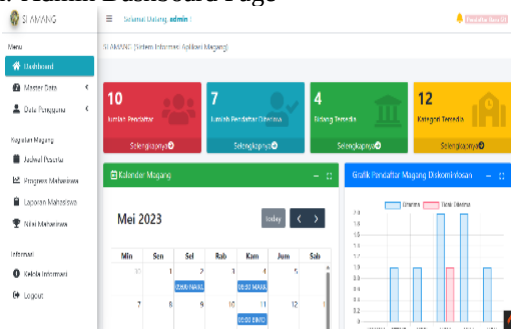
Source: (Pradana et al., 2023)
Figure 10. Stage 3 Registration Form

g. Registration Dashboard Page



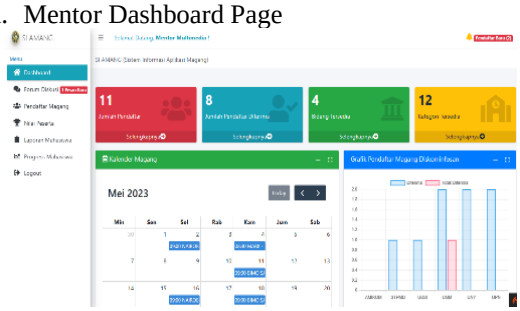
Source: (Pradana et al., 2023)
Figure 11. Registration Dashboard

h. Admin Dashboard Page



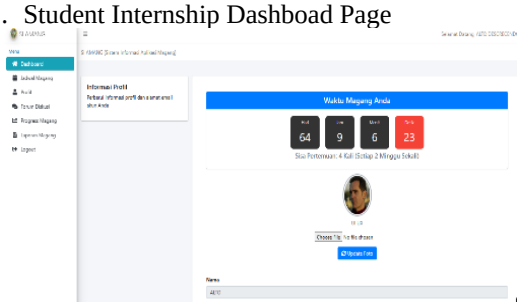
Source: (Pradana et al., 2023)
Figure 12. Admin Dashboard

i. Mentor Dashboard Page



Source: (Pradana et al., 2023)
Figure 13. Mentor Dashboard

j. Student Internship Dashboad Page



Source: (Pradana et al., 2023)
Figure 14. Student Internship Dashboard

4. Testing

At this stage testing uses the Black box testing method. at this stage testing is only carried out on forms related to the designed system business processes.

Black box testing is a software testing method that focuses on functionality, especially the input and output of the application being built, whether it is in accordance with user expectations or not (Meyliana et al., 2022). Black box testing, testing based on application details, such as the appearance of the application, functions in the application and the suitability of the function flow with the designer's desired work system (Uminingsih et al., 2022). Black box testing is suitable for use at the final testing stage, when application development is complete. The main purpose of black box testing is to ensure the quality and safety of the application before it is released to users. At the testing stage, the author tests several forms on the information

system created including: (a) Testing the Login Form, (b) Testing the Account Creation Form, (c) Testing the Student Internship Registration Form Stage 1, (d) Testing the Student Internship Registration Form Stage 2, (e) Testing the Student Internship Registration Form Stage 3, (f) Testing the Student Account Internship Progress Menu, (g) Testing the Student Account Internship Report Menu, (h) Testing the Field Menu on the Admin Account, (i) Testing the Category Menu on the Admin Account, (j) Testing Change Password on Student Dashboard Menu, (k) Testing the Forgot Password Feature, (l) Testing the Mentor Data Menu on the Admin Account, (m) Testing the Value Menu on the Mentor Account

Tabel 1. Testing Results with Black Box Method

1. Testing by Admin			
Interface Design	Results		Description
	As per	Not suitable	
Admin *login*	√	-	Good enough
Verification of Registrants	√	-	Easy to understand
Make a Schedule	-	√	Input start and end dates for existing participants, no need to input again, just input the guidance date and guidance hours.
View Internship *Progress* and Reports	√	-	Easy to understand
View Grades	√	-	Easy to understand
Add Field and Category Data	√	-	Simple
Add Campus List	√	-	Simple
Adding a Mentor	√	-	Easy and simple
Changing Information	√	-	Easy and simple
2. Mentor Testing			
Interface Design	Results		Description
	As per	Not suitable	
Mentor *Login*	√	-	Simple
View Schedule	√	-	Simple
View Registrant Data	√	-	Easy to understand
View Internship *Progress* and Reports	√	-	Easy to understand
Creating Values	√	-	Easy and simple
Using the Forgot *Password* Feature	√	-	Easy and simple
3. Student Testing			
Interface Design	Results		Description
	As per	Not suitable	
Creating an Account	√	-	Easy and simple
Enrollment	√	-	Easy and simple
Login	√	-	Simply
View Enrollment Results	√	-	Simple
View Internship Period	√	-	Simple
View Internship Schedule	√	-	Simple
Making *Progress* and Internship Report	√	-	Easy and simple
Downloading the Final Document	√	-	Easy and simple
Using the Forgot *Password* Feature	√	-	Easy and simple
Change Profile Photo and *Password*	√	-	Easy and simple

Source: (Pradana et al., 2023)

CONCLUSION

Based on the analysis of the current system at DISKOMINFOSAN Yogyakarta City and designing this internship application information system, it can be concluded that the Internship Application Information System (SI AMANG) is used to manage internship registration data and student internship data based on expertise according to their category. The Internship Application Information System (SI AMANG) makes it easy for DISKOMINFOSAN or system managers to manage the available fields and categories, mentor data for each category, information about internships, internship applicants accepted or not accepted, internship schedules, internship reports, internship progress and student internship grades. The Internship Application Information System (SI AMANG) was created so that internship registration and internship activities at DISKOMINFOSAN become more effective and efficient for both managing agencies and interns.

In this research, the method used is descriptive qualitative method to collect and analyze data. The data obtained and collected are descriptive and non-numerical, not in the form of numbers. Interviews and observations were made regarding the ongoing internship system at DISKOMINFOSAN. This research is focused on a specific case study regarding the apprenticeship application information system at the Yogyakarta City Informatics and Communication Office. To collect the data needed in this research, interview and observation methods were used. The purpose of this research is to understand and develop an internship application information system at the Communication and Information Technology Office of Yogyakarta City. The method applied in

software development is the waterfall method for designing the SI AMANG application. Software development is carried out sequentially from stage to stage Each stage must be completed before proceeding to the next stage.

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