Mobile-Based Design of Information System for Vocational Internship Activities for Vocational Students

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Abstract: Information technology that is growing slowly in modernization follows the development of an increasingly aging population, and has an impact on group and individual life. Information technology also provides easy and big things related to collecting the right information directly or indirectly, and citizens get various benefits that are taken through their technological innovations, covering all aspects of life and education. An obstacle that is felt by Brigjend Katamso II Medan Vocational School is still done manually when managing student Internship activities, for example, collecting information on internship student classes, attendance, data on internship places and groups, supervision and student activities and submitting grades are also still manual. Therefore, it is necessary to design an information system for student Internship activities using *API* pages and the *Java* programming language so that admins, supervisors, field supervisors and students of SMK Brigjend Katamso II Medan can access this system with their mobile device. In order to implement the application that the researcher wants to create, it will use an *R&D* approach, so that the data collection methods used are interviewing, observing and studying literature. The development of the system used in this internship activity system is using the *RAD* method during system development, in order to create a system that provides objective information and can provide assistance to SMK Brigjend Katamso II Medan. The purpose of this research can help the process of internship activities at SMK Brigjend Katamso II Medan and with this application it can control all activities easily and can be well documented.

Keywords: Education; Internship; Mobile; System; Technology

INTRODUCTION

Information technology that is growing slowly in modernization follows the development of an increasingly aging population, and has an impact on group and individual life. The development of information technology is always related to this life because it is in harmony with the development of science. Information technology also provides easy and big things related to collecting the right information directly or indirectly, and citizens get various benefits that are taken through its technological innovations covering all aspects of life and education (R. El Fauzi et al., 2021).

Vocational High School (SMK) education is a level of education that prioritizes the development of students skills in order to be able to carry out work in certain fields and the meaning of vocational programs related to employment (R. El Fauzi et al., 2021). SMK Brigjend Katamso II Medan is an educational institution that has three study programs, including business management, software engineering, and computer network engineering. Industrial Work Practice (INTERNSHIP) is a program that needs to be carried out by SMK Brigjend Katamso II Medan in order to carry out its part of the function of SMK. The implementation of this Internship requires appropriate school and company plans to ensure efficient and perfect implementation.

An obstacle that is felt by Brigjend Katamso II Medan Vocational Scholl is still done manually when managing internship activities, for example when collecting class data information, attendance, places and groups of Internship, supervision and Internship activities as well as submitting grades are still carried out manually, giving rise to a problem that so far occurred during the internship implementation, namely the archiving of data related to internship takes a long time, because the data recapitulation is still done through Microsoft Excel. In addition, the supervising teacher cannot monitor the activities and absences students every

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day because the Internship place is not always close to the location of the supervising teacher. In line with these problems, so that an information system that can manage all Internship activities is desired in an information system that is carried out by the latest development and is mobile-based in order to create conditions conducive to operating while conducting internship.

Research that has been carried out by Subarkah, Krisbiantoro, et al. in 2020 in the following research activities, *Waterfall* which is the method used in developing and designing systems and utilizing *UML* (Subarkah, Krisbiantoro, & ..., 2020). Existing research and carried out by Andria & Mumtahana in 2019, in this research activity, activities were carried out to design an Internship information system for UNIPMA, especially UPT Computer. This information system design has a web base and the results can be used to manage student data on Internship activities and carry out achiving activities in the form of activity journals (Andria & Mumtahana, 2019).

In this research, an information system with more complete features has been developed with supervision carried out by the supervising teacher so that it can save time in supervising students without having to always come to the Internship location, as well as developing the latest and mobile-based system development method aimed at making the process easier of Internship activities and keep up with technological developments that have developed rapidly.

So that users at SMK Brigjend Katamso II Medan can manage internship activities well and efficiently, one of the various ways is to use a *mobile*-based internship information system. Therefore, this *mobile*-based information system is designed to increase efficiency in the management of internship activities for students at SMK Brigjend Katamso II Medan. This is the background of research to design an information system entitled "*Mobile*-Based Design of Information System for Vocational Internship Activities for Vocational Students".

LITERATURE REVIEW

Based on Azhar Susanto's opinion, the system is a collection of systems, both non-physical and physical, that cooperate with each other and are in line to archive their goals (Nugroho, 2019). Referring to Tata Sutabri's opinion, the system is an association of parts that are strongly related and work together to achieve their goals (Nugroho, 2019). Information is data that has been classified, processed or interpreted so that it can be used in the decision-making process (Nugroho, 2019). Information means data that is processed into a form that is more useful and more meaningful to the party receiving it (Anggraini, Pasha, & Setiawan, 2020).

Referring to O'brian's opinion, an information system is an organized combination of various individuals, hardware, software, communication networks and data resources to change, collect and distribute information in organizations (Hidayat, 2020). Referring to Wibowo's opinion, internship is a form of cooperation between SMK carried out by management from companies and schools, trusting companies to help students achieve competencies in line with the curriculum (Pratama, Daryati, & Arthur, 2018).

This Internship is a mandatory program for each vocational school, meaning the location for students in vocational schools to carry out learning activities in the corporate world directly or in business (Putro, Supianto, & Pramono, 2019). Eclipse means an IDE (Integrated Development Environment) to carry out hardware development that can run on all platforms (Dewi & Tiara, 2017). In terms of standards, Eclipse always has JDT completeness, plug-ins that create eclipse can be used to develop java programs and PDE for new plug-ins development (Maisyaroh, Astriana, & Aan, 2017). Mobile applications are applications created specifically for mobile platforms that provide various linking mechanisms, including the interaction of web resources with mobile applications (Samsudin, Irawan, & Harahap, 2019).

PHP (Hypertext Preprocessor) is a programming language with a code base used to process data and return it to a web browser as HTML code (Maulana, Irawan Padli Nasution, & Ikhwan, 2020). Web *API* stands for Application Programming Interface which is used to integrate between applications to exchange data (Amalia, Arimbawa, & AfwaniRoyana, 2019). *MySQL* is a type of relational database management system, *MySQL* is a database program that can send and receive data that is open source, *MySQL* is commonly used for data processing and data processing commonly used is create, update, delete and select (Rahayu, Fajri, & Hambali, 2019)

METHOD

As an effort to implement applications that will be created by researchers, researchers use an R&D (Research and Development) approach to build applications. Using the R&D method, which is research used to create a product and test the effectiveness of the product (sugiyono, 2016). Development models can include conceptual, procedural and theoretical models. Procedural modeling means that the model is descriptive in nature, that is, it sets the stages that must be carried out in order to create a product. The data collection methods used include:

The first step is observation, in the observation stage, researchers carried out direct observations to SMK Brigjend Katamso II Medan so that they knew the process of student internship activities that took place at SMK Brigjend Katamso II Medan. The second step is interview, carrying out interviewing activities in order to obtain

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information and completeness in it. In this connection, it means that the researcher conducts interview activities in conjunction with the head of the department, the principal and various students of SMK Brigjend Katamso II Medan.

The third step is a literature study, a literature study is carried out by observing various researches that have been carried out such as thesis, journals and also literature related to the problems in this research.
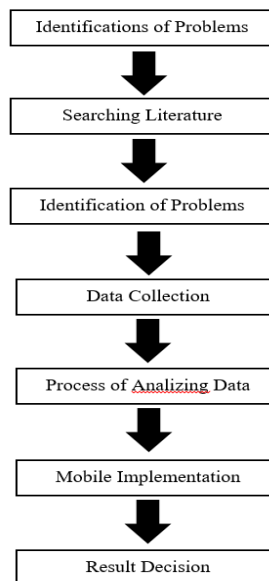

Figure 1. Research design

According to Pressman, the Rapid Application Development method is a software model process that develops slowly and systematically where the modeling process emphasizes a simple and efficient mechanism or development cycle (A. Fauzi & Harli, 2017). This method also has a fairly short limitation so that it does not require a lot of time at the planning stage and is relatively low cost (Sikumbang, Habibi, & Pane, 2020).

The first step in the RAD methods is requirements planning, the requirements plan includes analyzing system requirements, for example, analyzing the proposed system. In this stage, the researcher searches for data and information related to research and information needs, such as proposed system flow map, student data, internship group data, internship place data, attendance data, internship activity data and value data that will be needed in the system.

The second step in the RAD methods is design workshop, the purpose of this stage is to provide a description of the mapping to be carried out as well as a description of the stages to be carried out. At this design stage, the author uses two designs, the first is process design, and at the process design stage used is *Use Case Diagrams* and *Entity Relationship Diagrams.* The second is interface design, and at this stage an application interface design is carried out to describe the appearance of the application to be built.

The third step in the RAD methods is implementation, at the implementation stage, the application process is carried out based on the designs that have been made in the previous stages, starting from program coding to the testing stage which tests whether the application is running well or not. Below are the steps of RAD based on Kendall (Aini & Wicaksono, 2019) through Figure 2:
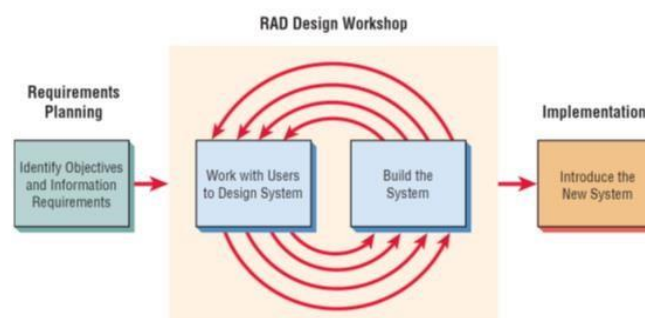

Figure 2. RAD Stages

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RESULT

Needs Analysis

In analyzing the needs in this research, the researcher uses a flow map of the proposed system, this flow map provides an explanation by detailing how a system works in order to provide an overview with a systematic system to the flow or path of the system he designed. The proposed system flow map can be described as:
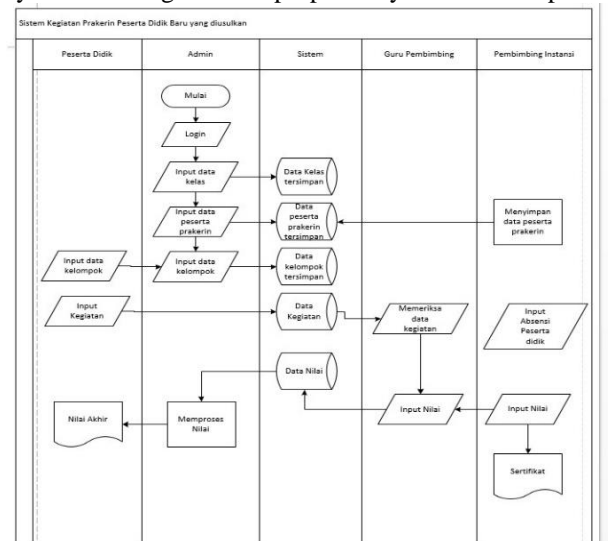

Figure 3. Proposed System Flow map

In the design of the proposed system flow map, there are four users, consisting of students who can input group data, activity data when doing internships and can see their internship scores, then there are admins who can input class data, student data and view group data inputted by students, then there is a supervising teacher who can see data on student activities when carrying out internship activities and can input student scores, then there is an agency supervisor who can input student attendance and grades.

System Planning

In system design, the researcher modeled the information system design for students' internship activities using two diagrams. The first diagram is a Use Case Diagram which is illustrated as follows:
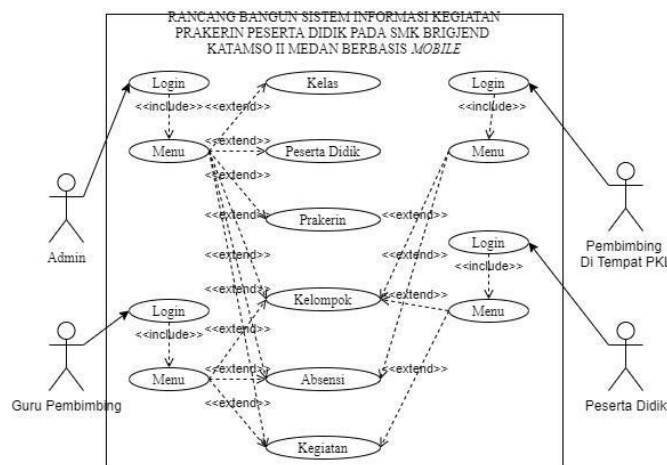

Figure 4. *Use Case Diagram* of Information System for Vocational Internship Activities

In the explanation, this *Use Case Diagram* has four users, consisting of admins, students, supervising teacher, and agency supervisors.
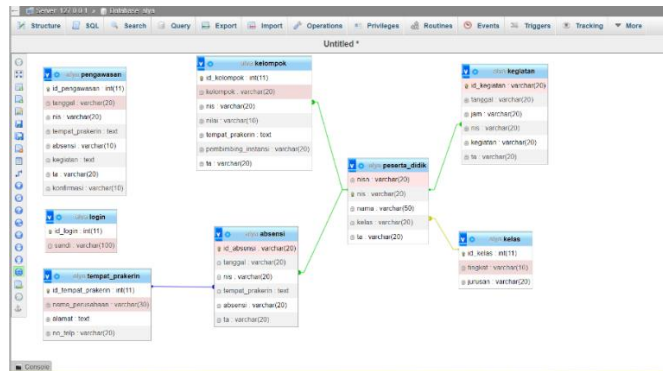
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Figure 5. *Entity Diagram Relationship*

The second diagram is an *Entity Relationship Diagram (ERD),* this diagram serves to describe the structure of the internship activity information system for Brigjend Katamso II Medan Vocational School.

System Implementation

The program code is carried out by researchers in the form of a user interface at the stage of system implementation. The design of the internship activity information system that has been created in the previous stage, is applied to the stages of implementing this information system which can be seen in the image below:
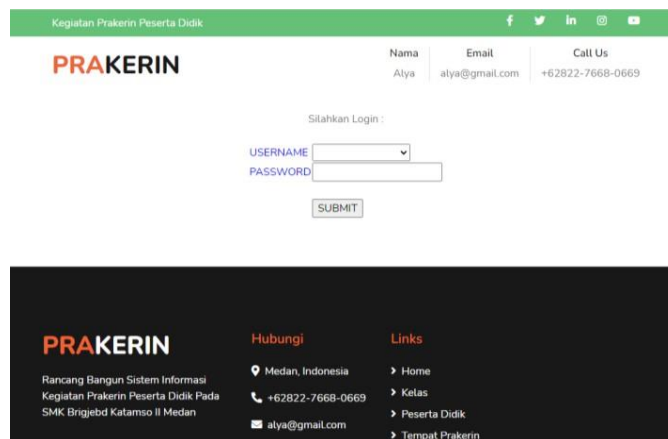

Figure 6. Login Page

In the display above there is a login and dashboard pages in the internship activity information system. The user must login in order to access the application. The implementation of the login by entering the username and password the pressing the login button. After successful login, the user is directed by the system to enter the dashboard page.
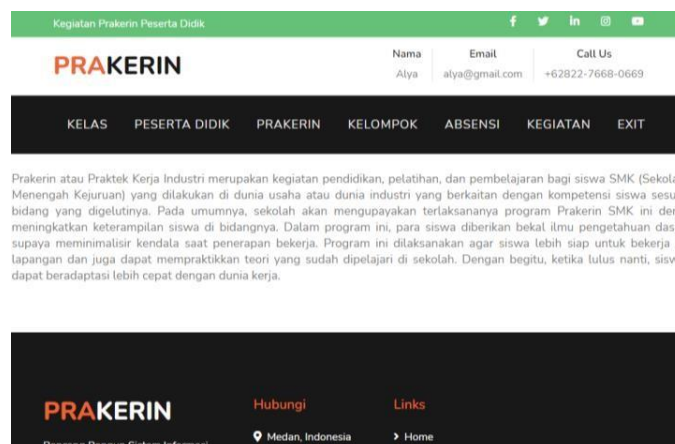

Figure 7. Main Menu Page

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In the display above is the display of the main menu page, in the menu, there are various menu options consisting of class data, student data, internship place data, group data, attendance data and exits.
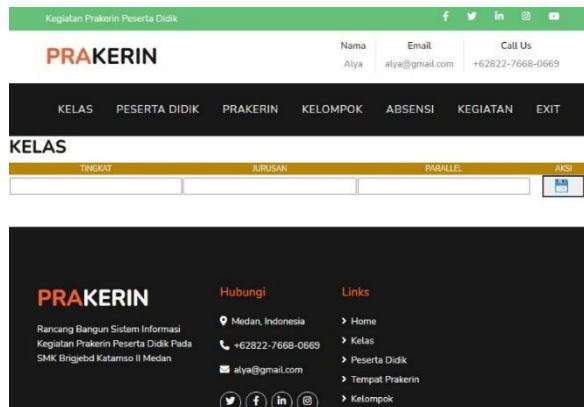

Figure 8. Class data page

The display above is the display of the class data page that can be accessed by the admin, which contains class information from students who are doing internship activities.
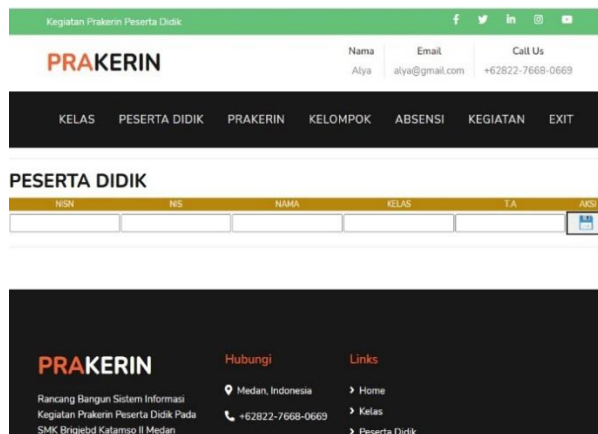

Figure 9. Student's data page

The display above is the display of the student data page that can be accessed by the admin, which contains information about students who are conducting internship activities.
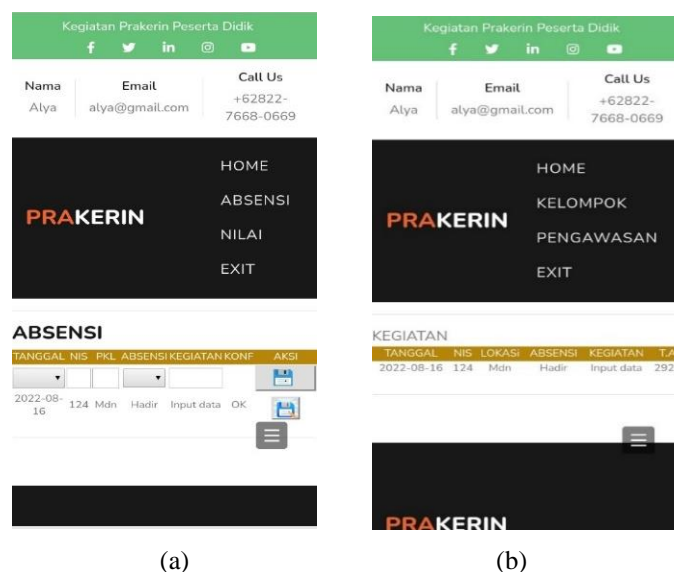

(a)   (b)

Figure 10. (a) Attendance page, and (b) Monitoring page

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In the display above part (a) is the display of the student attendance page that can be accessed by the agency supervisor, where the agency supervisor can input student attendance data. In part (b) is the display of the student monitoring page that can be accessed by the supervising teacher, where the supervising teacher can view and supervise the activity data and student attendance.

DISCUSSIONS

This research that produces an information system for student's internship activities is one of the efforts to contribute in managing internship activities at Brigjend Katamso II Medan Vocational School which is still done manually. Several stages were carried out in this research to produce the final product of the information system for student internship activities, namely identifying problems, searching for literature, collecting data, processing data analysis, and implementing Mobile-based, and result decisions. While in the stage of system development using the RAD methods has three stages, namely: Requirements planning, design workshop, and implementation.

After successfully designing and making this internship activity application, the researcher conducted a test to find out the application that was made had problems or not when used, the test was carried out by the researcher by installing an application that was still in the form of an APK to a smartphone. On the results of the tests carried out, no obstacles were found during the testing process. The application can run and function smoothly as expected by researchers and users. It is hoped that the next researchers can develop the system further in order to provide benefits for users.

CONCLUSION

Refers to the implementation and testing that has been carried out during the process of creating the system, so that various conclusions can be determined, namely including, a mobile-based internship information system that can assist the process of internship activities at the Brigjend Katamso II Medan Vocational High School. The process of getting information is much easier and faster. Controlling all activities becomes easy and can be well documented. Supervising teachers can also easily find out the activities and attendance lists of students without having to come to the company often and can save time. The development of an information system for mobile-based internship activities uses the R&D research method with the RAD development model. In general, this system has fulfilled the user's information needs in carrying out activities while students are doing internship. The existence of this system is expected to help Brigjend Katamso II Medan Vocational School in managing internship activities effectively and efficiently. The next researcher can do further system development in order to be able to provide benefits to the users.

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