JITK (JURNAL ILMU PENGETAHUAN DAN TEKNOLOGI KOMPUTER)

VOL. 6. NO. 1 AUGUST 2020
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v6i1.1382

APPLICATION OF NEW STUDENT REGISTRATION BASED ON MOBILE AT SMK SINAR HUSNI MEDAN

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Abstract—Sinar Husni Vocational School still uses the manual method of registering new students, resulting in several problems or obstacles. Problems encountered include, prospective students need time, energy and large costs in the registration process because prospective students must come directly to the school to see registration information and fill out the registration form, the administration process of admission of new students tends to be slow, because there is prospective student data those who have registered have not been integrated and managed well, making reports of prospective students who register takes quite a long time, and the work process becomes slower and there are frequent errors and repetitions in making the report and still use the archives in physical form so that they are vulnerable to damage or even missing. This research, the author uses the experimental method, the authors build a new student registration application based on Android mobile. The purpose of this research is to build an Android-based mobile application that can be used by prospective students in registering and can help the Sinar Husni Vocational School in processing data registration of new students and the process of making reports of prospective students. The application is designed and built using the waterfall model, so that each research activity is based on the stages contained in the waterfall model. The application is built using the codular and airtable database. The expected outcome of this research activity is the application of new student registration at SMK Sinar Husni which can be used to solve problems that occur in the current registration system.

Keywords: Application , Registration, Students, Android Mobile

Abstrak—SMK Sinar Husni masih menggunakan cara manual dalam melakukan pendaftaran siswa baru, sehingga terjadi beberapa masalah atau kendala. Permasalahan yang dihadapi antara lain, calon siswa membutuhkan waktu, tenaga dan biaya yang besar dalam proses pendaftaran karena calon siswa harus datang langsung ke sekolah untuk melihat informasi pendaftaran dan melakukan pengisian formulir pendaftaran, proses administrasi penerimaan siswa baru cenderung lambat, karena ada data calon siswa yang telah mendaftar belum terintegrasi dan terkelola dengan baik, pembuatan laporan calon siswa yang mendaftar membutuhkan waktu yang cukup lama, dan proses kerja menjadi lebih lambat serta sering terjadi kesalahan dan perulangan dalam pembuatan laporan tersebut dan masih menggunakan arsip dalam bentuk fisik sehingga rentan mengalami kerusakan atau bahkan hilang. Penelitian ini, penulis menggunakan metode eksperimen, penulis membangun sebuah aplikasi pendaftaran siswa baru berbasis *mobile* android. Tujuan dari penelitian ini adalah untuk membangun sebuah aplikasi berbasis *mobile* android yang dapat digunakan oleh calon siswa dalam melakukan pendaftaran dan dapat membantu pihak SMK Sinar Husni dalam melakukan pengolahan data pendaftaran siswa baru dan proses pembuatan laporan calon siswa. Aplikasi dirancang dan dibangun dengan menggunakan model *waterfall*, sehingga setiap kegiatan penelitian berdasarkan tahapan yang terdapat pada model *waterfall* tersebut. Aplikasi dibangun dengan menggunakan kodular dan *database* airtable. Hasil yang diharapkan dari kegiatan penelitian ini adalah aplikasi pendaftaran siswa baru pada SMK Sinar Husni yang dapat digunakan untuk menyelesaikan permasalahan yang terjadi pada sistem pendaftaran yang sedang berjalan.

Kata Kunci: Aplikasi, Pendaftaran, Siswa, Mobile Android

INTRODUCTION

Technological development from time to time is increasingly marked by the many innovations that exist such as smart devices that can be carried anywhere with the palm of your hand. With the development of technology, of course, daily activities both in companies, universities and in schools become easier and save time [1].

New student registration activities are routine activities carried out by the school in each new school year. At present not many schools in Indonesia have implemented a new student admission system online. In line with the development of information and communication technology such as internet technology that can support the process of input and output data accurately and efficiently, especially in the activities of new student admissions [2].

SMK Sinar Husni is a SMK in the city of Medan. In the process of accepting new students, SMK Sinar Husni still uses methods that have not been computerized. To obtain information about the admission of new students, prospective students must come directly to school and register. Prospective students must fill out the registration form and prepare the required documents in the registration process.

So the problems that occur can be identified as follows: Prospective students need time, effort and large costs in the registration process because prospective students must come directly to the school to see registration information and fill out the registration form [2]. The administration process of admission of new students tends to be slow because there is data on prospective students who have registered not yet integrated and well managed, making reports of prospective students whom register takes quite a long time, and the work process becomes slower and errors often occur [3]. Reports still use archives in physical form so they are vulnerable to damage or even lost [3].

The purpose of this research is to design and build a new student registration information system that can help prospective students register and assist the SMK Sinar Husni in processing registration data quickly and easily via mobile android.

Similar research has been conducted:

Sidik ,and Rahmawati [1] in 2018, with the title "Designing a Web-Based New Student Registration Information System at SMK Bina Putra". In this study discusses the registration of new students at SMK Bina Putra. Prospective students can make the registration process at SMK Bina Putra easily and quickly through a web-based registration information system. The information system built can assist prospective students in registering easily and quickly and can overcome problems that occur in the registration process that is running [1] .

Zain, Sari and Arif [4] in 2018 with the title "Development of a Web-Based New Student Admission Information System at SMA 1 Annuqayah Sumenep". In this study, the author discusses the process of registering new students at SMA 1 Annuqayah Sumenep. The author builds a web-based student registration system using the PHP programming language and MySQL database. In conducting research, the author uses the ADDIE development model which consists of 5 stages, namely Analysis, Design, Development, Implementation, and Evaluation stage [4].

Astuti, Marisa, and Febriani [5] in 2014 with the title "Web-Based New Student Admission Information System (Case Study of Kutai Kartanegara Regency)". In this study, the author discusses the process of admitting new junior high school students in Kutai Kartanegara Regency by determining indicators based on UN scores. The author builds a web-based application that can be used in the process of admitting new students with the PHP programming language, MySQL database and HTML [5].

Irfan and Soyusiawaty [6] published by Prof. Soepomo in 2015 with the title "Online and Web-Based Regular New Student Admission Application (PSB) Integrated with Sms Gateway Case Study in State High School 1 Compassionate". In this study, the author discusses the process of developing a web-based regular new admissions application that is integrated with mobile and SMS gateways [6].

Lantoro [7] in 2018 with the title "Information System for New Student Registration at Al Huda Vocational School in Kediri, Web-Based". In this study, the author discusses the problems that occur in the process of registering new students at Al Huda Vocational School in Kediri and building a web-based new student registration information system that can be used to resolve problems that occur in the process of registering new students at Al Huda Vocational School in Kediri [7].

Witanto, and Solihin [3] in 2016 with the title "Web-Based New Student Admission Information System Design (Case Study: SMP Plus Babussalam Bandung)". In this study, the author discusses the process of building a new web-based admissions information system at the Babussalam Bandung Plus Junior High School using a prototype model with an object-oriented system approach that is modelled using UML (Unified Modeling Language) [3].

Patta [8] in 2014 with the title "Development of Information Systems for Student-Based Acceptance on Web and Sms Gateway". In this study, the author discusses the process of building a web-based information system for student acceptance that is integrated with the SMS gateway, so that it can facilitate prospective students to receive information about the registration process [8].

Fandhilah, Rindina, Ferdiansyah, and Ishaq[9] in 2019 with the title "Implementation of the Waterfall Method in the Development of Information Systems for Web-Based New Student

Accredited Rank 3 (Sinta 3) based on the Decree of the Dirjen Penguatan RisBang Kemenristekdikti
No. 28/E/KPT/2019, September 26, 2019. Published by PPPM STMIK Nusa Mandiri

VOL. 6. NO. 1 AUGUST 2020
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
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Admission at State Vocational School 2 Adiwerna". In this study, the author discusses the problems that occur in the process of admission of new students at the State Vocational School 2 Adiwerna and discusses the process of building a new web-based admissions information system with PHP programming language and MySQL database. While the method used in this study is the waterfall method [9].

Yuniva, and Syafi' [10] in 2018 with the title "The Waterfall Model Approach in Designing a Web System for Accepting New Student Information Systems Using the Bootstrap Framework". In this study, the author discusses the process of designing web-based student acceptance information systems. The information system is built with PHP programming language and bootstrap framework. The model used is the waterfall model while the tool used for information system design is the ERD (Entity Relationship Diagram) [10].

Supriyadi, and Lutfiyana [11] in 2020 with the title "Designing a New Student Registration Information System at Web Pusaka 1 Jakarta Based on Web". In this study, the authors discuss the process of designing information systems using the waterfall model. While in the development of information systems, the authors use HTML programming language, MySQL database and bootstrap [11].

MATERIALS AND METHODS

Research Methods

Android mobile is a device that is being used by most people. Besides being used for communication media, mobile android is widely used by the public in obtaining information quickly and easily and helping human work.

The research method used by the author is conducting research is experimentation. The author develops from a system that is running manually into a system based on computer technology using mobile android. The author tested the application development on the platform that is being used by most people, namely mobile android.

After the application is successfully built and implemented, the authors evaluate the success of the application when it is used by prospective students or the SMK Sinar Husni.

Systems Development Method

The system development method used in this study uses the waterfall approach by following per under the stages contained in the waterfall model [10]. The waterfall model software development model introduced by Winston Royce in the 70s is a simple classic model with a linear system flow. The output from the previous stage as input for the next stage [12]. This means that each stage in this method is carried out sequentially and continuously [13]. So if step one has not been worked out it will not be able to do steps 2, 3 and so on [14].

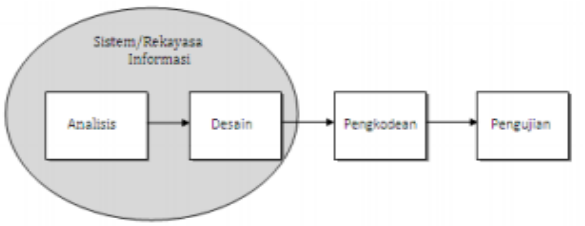

Figure 1 Waterfall Model

Based on Figure 1 above, in this model, there are several stages namely [10] :

1. System Requirements Analysis

In designing this mobile-based application the Admin needs to be able to manage registration information and view the data of prospective students who have registered.

2. Design

The design is the stage of making a design of the application to be built. The tools used in making this system design are UML (Unified Modeling Language) which consists of Use Case Diagrams, Activity Diagrams, Sequence Diagrams, and Class Diagrams.

3. Code Generation

Program code writing is the stage of translating the system design into commands that are understood by computers using Kodular and Airtable database.

4. Testing

At this stage, all input and output processes are tested so that the possibility of errors and bugs can be immediately identified and improvements made in writing the program code.

5. Support

To run the new student admission application that has been made, we need hardware to support the system, namely CPU, hard drive, monitor, mouse, keyboard and Android smartphone. While the supporting software is the Microsoft Windows operating system, Kodular applications and the Airtable Database

Method Of Collecting Data

While the data collection methods used in this research activity include:

1. Observation (Direct Observation)

The author makes direct observations at the study site to observe the process of registering new

students and look for problems that occur in the process at SMK Sinar Husni

2. Interview

The author made a direct question and answer to the SMK Sinar Husni about the registration process of new students and the problems that occur from the process.

3. Literature Study

The author is looking for sources of reference from theories that support research activities, both from books, journals, the internet and from other sources.

RESULTS AND DISCUSSION

Problem Analysis

The registration process or re-registration of new student admissions is still carried out conventionally, in the sense that it is still done manually because the form is still used in making student data collection that causes long queues, so prospective students often inconvenience [15]. By doing this, there are still problems or obstacles that occur. These problems include:

a. Prospective students require a lot of money, energy and time in the registration process
b. The difficulty of making a recapitulation of new student registration reports
c. The difficulty of searching for registration data that has been done
d. Requires physical storage and space to put the storage.

System Requirements Analysis

Based on the problems that occur in the results of the analysis of the system that has been running, the authors determine one solution that can be used to resolve the problem. By utilizing mobile android, the author wants to design and build a new student registration application at SMK Sinar Husni. Applications built can be used by prospective students to make the registration process quickly and easily and can also be utilized by the Sinar Husni Vocational School to see registration information that has been done and make a recapitulation of the registration of new students.

System Design

The tools used in making system design are UML (Unified Modeling Language) Diagrams. UML (Unified Modeling Language) is a visual language for modelling and communication about a system using diagrams and supporting texts [16]. UML (Unified Modeling Language) diagrams in student registration applications consist of Use Case Diagrams, Sequence Diagrams, Activity Diagrams and Class Diagrams.

Use Case Diagram

Use Case Diagram describes the interaction between one or more actors with the application to be made [3].

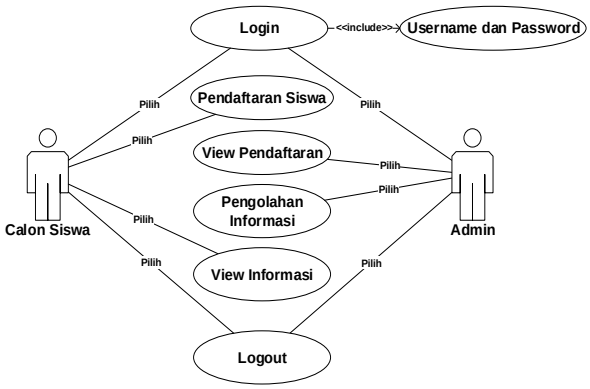

Figure . Use Case Diagram

Use case diagram in Figure 2 explains what the user can do to the application to be built. The actors involved consist of admin and prospective students. Each user has different access rights. Admin can do the processing of registration information and view system candidate data of students who have registered. While prospective students can carry out the registration process and view registration information that has been processed by the admin.

Sequence Diagram

Sequence Diagrams illustrate how users interact with applications to get the information needed [17].

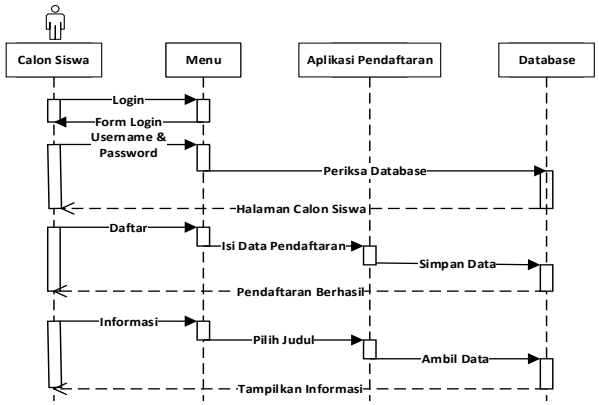

Figure 3. Sequence Diagram

The Sequence diagram in Figure 3 explains how prospective students interact with the application to be built to get the information needed about the registration process. Before prospective students can proceed with the registration process, prospective students must log in first. After that, prospective students can register by entering the specified data. Besides, prospective students can also view the information by title.

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VOL. 6. NO. 1 AUGUST 2020
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
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Activity Diagram

Activity diagram illustrates a series of streams of activities, used to describe the activities formed in one operation so that it can also be for other activities [18].

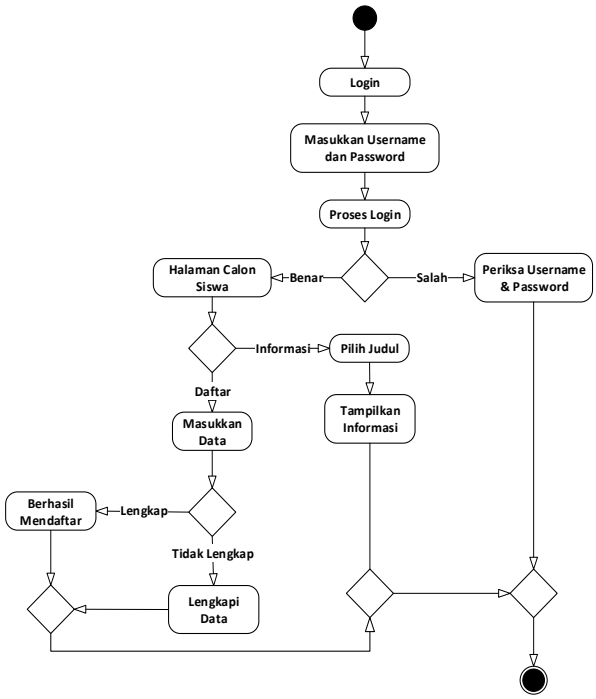

Image 4 Activity Diagram

The activity diagram in Figure 4 illustrates how the system runs the function chosen by prospective students. During the login process, the system verifies based on the account that has been registered. If the login is successful, then prospective students can enter the options menu and select the available menus including the registration menu and the information menu. But if it is wrong, the system will display a notification and prospective students are asked to double-check the account entered. On the registration page, the system displays forms that must be filled in by prospective students online or digitally. Whereas on the information page, the system displays the title of information that has been processed. The system displays information based on the title of information that has been selected by prospective students.

Class Diagram

Class Diagram is a diagram that illustrates the relationship of each class or table contained in the database [19].

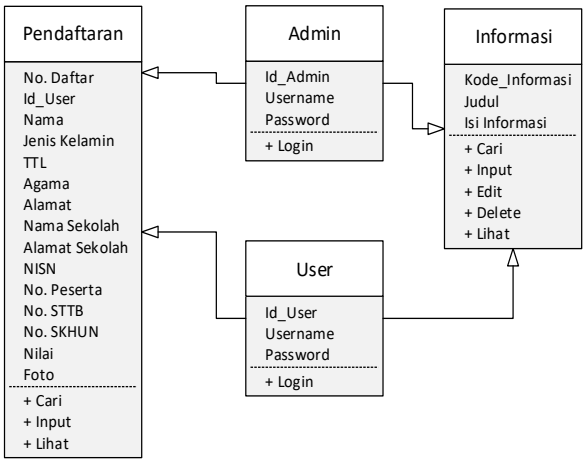

Figure 5. Class Diagram

The class diagram in Figure 5 explains the table or class in the new student registration application database consisting of the admin table, user table, registration table and information table. Each table stores the data needed during the registration process.

Application Testing

In testing applications, the writer uses testing strategies which include:

1. Unit Test

Unit tests include sets of one or more programs that are designed to verify source code units, such as methods or classes.

The Android platform has a previously integrated unit 3.0 framework. An open-source framework for automating Unit Testing. The Android Testing Framework is a powerful tool for developers to write effective unit testing programs.

In unit testing, the author tests each unit or user interface contained in the application for the registration of new students at SMK Sinar Husni. Such as buttons, dialogue boxes, Figures, menus, touch and so forth.

2. Integration Test

In Integration Testing, all modules or units tested will be combined and verified. On Android, integration tests often involve checking integration with Android components such as Service testing, activity testing, Content Provider testing, etc.

In this test, the author tests each process and module contained in the application and the relationship of each module. Such as the login process, selection menu, registration process and registration information processing.

3. Operational Test

Operations are also called Functional Tests or Acceptance Tests. High-level operational tests

designed to check the completeness and correctness of the application.

In this test, the author tests every complete form of each process contained in the new student registration application. Like the login process, the registration process and student data processing. In each process, the user must complete the required data in full, if the data entered is incomplete, then the application will display a notification.

4. System Test

In System Testing, the system is tested as a whole and interactions between components, software, and hardware are examined. On Android, System Testing usually includes GUI Tests, Usability Tests, Performance Tests

This test is a complex test conducted by the author. The author tests the application that has been built. The author conducts testing ranging from testing the interface or appearance of the application, the performance of each process, input, process, and output generated and the usefulness of the application after it is implemented in the user environment, you can see in Table 1..

Table 1 Testing Table

Module Testing	Scenario Testing	Results Expected	Conclusions
Form Login	- Enter your Username and Password correctly - Click "Login"	Successfully Login and enter the options menu Valid	Valid
Form Login	- Empty the Password - Click "Login"	Login failed, display message "Enter Password" Invalid	Invalid
Registration Form	- Enter the complete registration data - Click "Input"	Display the message "Registration successful" and registration data successfully added to the database	Valid
Registration Form	- Leave one of the registration data blanks - Click "Input"	Show message "Enter xxx", registration data failed to be added	Invalid
Information Form	- Enter the complete information data - Click "Input"	Display the message "Information successfully added" and information successfully added to the database	Valid
Form Informasi	- Clear one of the information data - Click "Input"	Display the message "Enter xxx", data information failed to be added	Invalid

System Implementation

Following is the appearance of the new student registration application that has been built. The application page display consists of the account registration page, login, options menu, new student registration and information.

a. Account Registration Page Display

In Figure 6, prospective students can register an account which can later be used to login to the new student registration application.

Figure 6 Account Registration Page Display

b. Display Login Page

In Figure 7, prospective students must log in first by entering the username and password that have been registered previously.

VOL. 6. NO. 1 AUGUST 2020
P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v6i1.1382

Figure 7 Display Login Page

c. Display Page Options Menu

In Figure 8, prospective students can choose the menu available from the student registration application

Figure 8 Display Page Options Menu

d. New Student Registration Page Display

In Figure 9, prospective students can register new students by entering the data that has been determined.

Figure 9 New Student Registration Page Display

e. Information Page Display

In Figure 10, prospective students can see information relating to the process of enrolling new students at SMK Sinar Husni.

Figure 10. Information Page Display

CONCLUSION

After conducting this research, the authors conclude the research that has been done regarding the design of new student registration applications on the Android-based Sinar Sinar Husni Vocational School. go online and make it easier for the Sinar Husni Vocational School to deliver new student registration information and make a recapitulation report on student registration data via mobile android. Besides, the existence of this application can replace the registration system which manually becomes an information technology-based registration system via Android mobile.

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