

Academic Information System Islamic State University (UIN) Sunan Kalijaga Yogyakarta Android Based

Suryana Wijaya

Faculty of Science and Technology
Islamic State University (UIN) Sunan
Kalijaga
Yogyakarta, Indonesia
jaya547@yahoo.co.id

Muhammad Dzulfikar Fauzi

Faculty of Science and Technology
Islamic State University (UIN) Sunan
Kalijaga
Yogyakarta, Indonesia
dzulfikar1234567@gmail.com

Agung Fatwanto

Informatics Department, Master Program
Faculty of Science and Technology
Islamic State University (UIN) Sunan
Kalijaga
Yogyakarta, Indonesia
agung.fatwanto@uin-suka.ac.id

Abstract—The development of information systems is done so that the system gets better performance and is more in line with the wishes of users. However, until now there is no academic information system for UIN Sunan Kalijaga specifically developed based on mobile. In fact, mobile technology is currently growing very rapidly in Indonesia. Based on the Nielsen survey as of May 2011, the number of mobile device users in Indonesia reached 125 million out of the 238 million population. For this reason, it is necessary to develop the Academic Information System of UIN Sunan Kalijaga based on mobile, especially Android.

The system development methodology used in this study is SDLC (Software Development Life Cycle). The steps are Analysis of system requirements, system design, and design, system implementation, testing, and evaluation.

This research results an application that can be used to access academic information, such as schedule to attend the lecture, schedule of examination, card of yield study, presence and history of performance index. The special thing of this application is user still can see the academic information although offline with some condition.

Keywords-*Information System; Academic; Android*

I. INTRODUCTION

The academic information system at a university is something very important for its students. Academic information systems can be used to see the number of attendees, see the value and index of achievement so that the information system must always be given maintenance and development.

Research related to academic information systems already had been conducted in 2005 by Gajah Mada University students with the title Academic Information System of the Nurse Academy (AKPER) Bethesda [1]. The system created, is used to process lecturer data, student data, course data, and KRS. This system is made with Microsoft Visual Basic 6.0 and its database uses Microsoft Office Access 2000. Design reports using Report Environment data. The results of this study, the system can be used to add data, edit data, delete data and create reports relating to lecturer data, student data, lecture data, and KRS data.

Similar research was also carried out in 2008 with the title of the Academic Information System of the Faculty of Mathematics and Natural Sciences (MIPA) of Gajah Mada University. This research was made with the aim of accessing academic information systems can be done outside the campus environment. This makes it easy for students and lecturers to find out information on class schedules, test schedules and grades of courses. A web-based system using APACHE. The programming language used is PHP. For the database using MySQL [2].

Similar research was carried out with the title of the Academic Information System of the WAP-based Shipping Science Education and Training Institute. This study uses Wireless Markup Language (WML) and PHP programming, using a MySQL database. The results obtained in this study are that the academic information system in the Shipping Science Education and Training institution can be accessed through mobile devices so that it is easier for the trainees to see the results of the education and training they have carried out [3].

In fact, mobile technology is currently growing very rapidly in Indonesia. Based on the Nielsen survey as of May 2011, the number of mobile device users in Indonesia reached 125 million out of the 238 million population. These mobile devices include mobile phones, smartphones, and tablets.

Android is a complete platform starting from the operating system, applications, developing tools (developer tools), application markets, mobile industry vendor support and support from the open system community. In addition, in 2009, the smartphone market for Android grew 1073.5% when no other platform reached 100% growth [4].

Based on the above problems, the authors are interested in creating an academic information system on Sunan Kalijaga State Islamic University based on Android. This application is expected to have several advantages, both in terms of operational ease, speed of access, and complete application features.

II. SYSTEM DEVELOPMENT ARCHITECTURE DESIGN

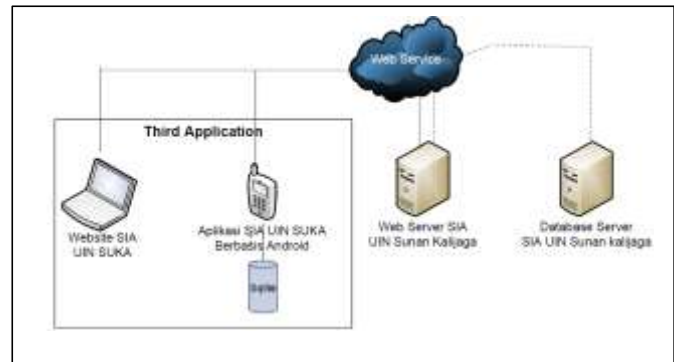


Figure 1. System Development Architecture Design

Figure 1 shows the design of the new academic information system at Sunan Kalijaga UIN. In the process of designing a new architecture, there are additional applications from third parties (Third Application), namely the application of an academic information system based on Android. This application cannot directly access the data contained in the academic information system database of Sunan Kalijaga UIN. To access data in the database, a web service is needed. The Android-based SIA application acts as a client. Henceforth, this application is named SianDroid.

As for the explanation in Figure 1, the application will send several parameters, such as NIM, school year and semester. Then the parameters on the Android device will become parameters on the web service. These parameters will then be matched with the data on the database server. If there is data that matches the parameters, the web service will display the data in the form of JSON (JavaScript Object Notation) format.

The JSON format will then be sent to an Android device. Then a parsing process occurs or a way to break down a series of inputs into variables with String data types. These variables will then be saved to the SQLite database. Data will be called with certain queries and displayed in the form of a list. With architects like this, data will remain stored on an Android device and can still see the data offline.

III. USE CASE DIAGRAM

Use case diagram is a description of system activity that is seen from the actor's needs. At this stage describes the relationship between actors with the system. The use case diagram of the SianDroid application can be seen in Figure 2.

Use case diagram of the academic information system of UIN Sunan Kalijaga based on Android, as seen in Figure 2 illustrates the actors involved in the system, namely students. Actors can carry out system functionality by accessing academic data such as class schedules, UTS schedules, UAS schedules, attendance, and IP history. Before you can use all the functionality, the actor must log in first. Without login, all of the data cannot be seen.



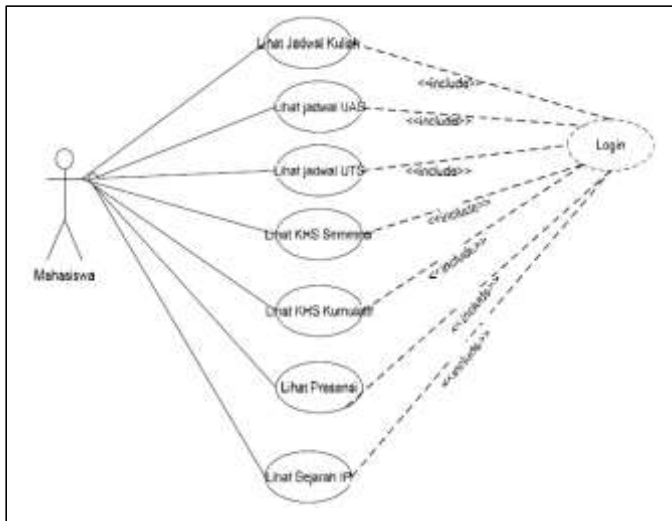


Figure 2. Use Case Diagram of SiaNdroid

IV. CLASS DIAGRAM

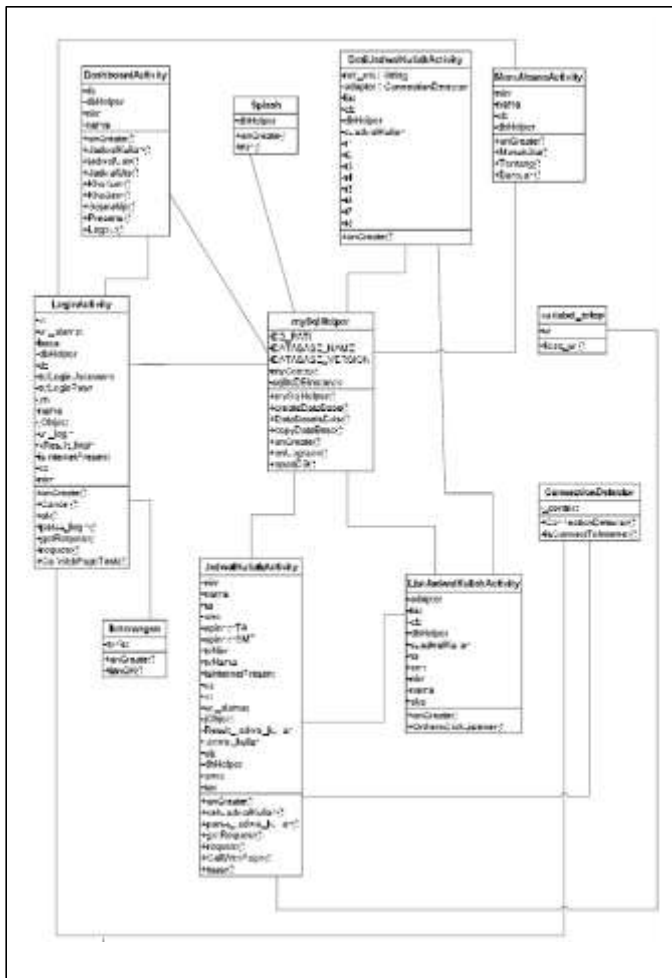


Figure 3. Class Diagrams of SianDroid

Class Diagrams help in visualizing the structure of the classes of a system and are the most widely used type of

diagram. Class diagrams also show relationships between classes and detailed explanations of each class in the design model (logical view) of a system. The class diagram of the SiaNdroid application can be seen in Figure 3.

A. Class mySqlHelper

This class has a very important role because it is associated with many other classes. The mySqlHelper class is used to create a local database on an Android device. This class also sets the path where the database is stored. All temporary data is stored in this database.

B. Class ConnectionDetector

The ConnectionDetector class is used to detect whether the device used is having an internet connection or not. If connected to the internet, it will give a return value that is "true". But if it is not connected, it will give a return value that is "false."

C. Class variabel_tetap

Fixed variable classes have url attributes. This attribute contains the url address to retrieve data that is on the server. This class is made to make it easier to call the url address and to avoid writing errors in the url address.

D. Class Splash

The splash class is the activity class that was first run when the application was opened. This class will create a useless database if the database does not yet exist. The splash class appears in 3 seconds, then directs the user to the main activity menu.

E. Class MenuUtamaActivity

This class is an activity to display the main menu form. The main menu contains "Enter SIA", "Help" and "About" buttons.

F. Class LoginActivity

As the name implies, this class is an activity that displays the login form. In this class, there is a mechanism for handling user authentication and handling internet connection detection. The NIM that the user enters in this class, will be saved directly to the local database.

G. Class keterangan

The information class functions to display messages to the user if the user fails the authentication or the user is not connected to the internet. This information class functions almost the same as the dialog box.

H. Class Dashboard

The dashboard class functions for system navigation. That is, by entering the form dashboard, users can see the entire menu, such as class schedules, UAS schedules, UTS schedules, attendance, and others.

I. Class JadwalKuliahActivity

This class functions to get input parameters from the user. The parameters included are the school year and semester. In this class, there is a mechanism for retrieving data from the server. The data is then parsed and stored in a local database. Classes that are similar in function to the Activity Class Schedule include the General Activity Schedule, the Activity Schedule, the



KhsSemester Activity, the Khsumulative Activity, the Presence Activity, the OpActivity History.

J. Class ListJadwalKuliahActivity

This class serves to display data in the form of a list. The data in the local database is a data source in the list. Only a few columns of data are displayed by this class. Classes that are similar in function to the ListActivity Schedule class between ListJadwalUasActivity, ListJadwalUtsActivity, ListKhsSemester Activity, ListKhsKumulatif Activity, ListPresensiActivity, ListSistoryIpActivity.

K. Class DetailJadwalKuliahActivity

In general, this class is almost the same as the ListJadwalKuliahActivity class. This class displays data on class schedules in detail. All class schedule data appear in this class. Classes that are similar in function to the Class DetailActivity Schedule between DetilJadwalUasActivity, DetilJadwalUtsActivity, DetilKhsSemesterActivity, DetilKhsKumulatifActivity, DetilPresensiActivity, DetilSejarahIpActivity.

V. STATECHART DIAGRAM

Statechart Diagrams are used to model the dynamic behavior of a class or object. Statechart diagram shows the sequence of momentary states (states) that an object traverses, events that cause a transition from one state or activity to another, and actions that cause changes in one state or activity.

A. Statechart Diagram Login

Statechart login diagram starts when the user enters NIM and password. After that, it will be verified by the application. When it is true, the user will enter the form dashboard. While when it is false, the user must enter the NIM and password again. Statechart login diagram is shown in Figure 4.

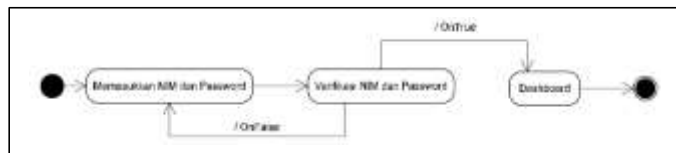


Figure 4. Statechart Diagram Login

B. Statechart Diagram Jadwal Kuliah

Statechart diagram class schedule starts when the user is on the class schedule form. When the user presses the button, the user goes to the class schedule form list. On this form, if the user presses the back button, the user will return to the class schedule form. And if the user clicks on an item, the user will go to the detailed course schedule form. The statechart design of class schedule diagrams is the same as the statechart design diagram of the UAS schedule, UTS schedule, semester KHS, cumulative KHS, attendance, and index performance history. The statechart class schedule diagram is in Figure 5

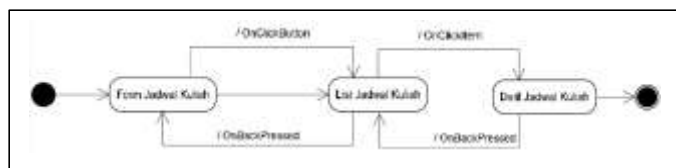


Figure 5. Statechart Diagram Jadwal Kuliah

VI. SEQUENCE DIAGRAM

Sequence diagrams are used to model usage scenarios. Usage scenarios are sequences of events that occur during system execution. This diagram shows step by step what should happen to produce something in the use case. In simpler languages, a sequence diagram is the interaction of objects arranged in a one-time sequence.

A. Sequence Diagram Proses Login

A sequence of the login process, namely students open the application, then students choose "Enter SIA". After that a login form will appear, so students must enter valid data and passwords. The data entered will be checked on the table in the academic database. If the data nim and password are valid, the student will enter the dashboard page. The login process sequence diagram can be seen in Figure 6

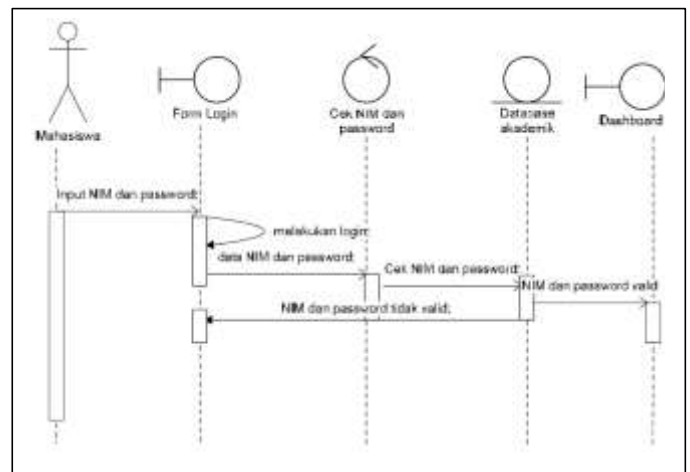


Figure 6. Sequence Diagram Proses Login

B. Sequence Diagram Proses Lihat Jadwal Kuliah

A sequence of the process Lihat Jadwal Kuliah, that is, after the login, the dashboard form will appear. Students choose the class schedule menu on the form, then a form will appear to Lihat Jadwal Kuliah. Students enter semester and school year data to see the class schedule they want to know. The system will retrieve data based on the input data, semester and school year entered, in the academic database. Information on class schedules will be displayed on the form See Lecture Schedule. Sequence diagram process sees class schedules can be seen in Figure 7.



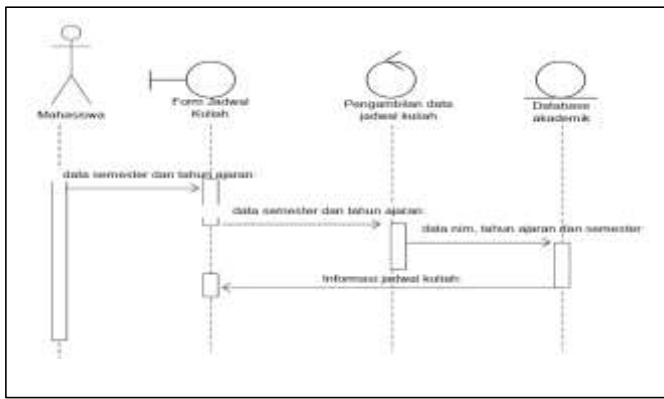


Figure 7. Sequence Diagram Proses Lihat Jadwal Kuliah

C. Sequence Diagram Proses Lihat Jadwal UAS

A sequence of the process See the UAS Schedule, that is, after the login, the dashboard form will appear. Students choose the UAS Schedule menu on the form, the form will appear to See the UAS Schedule. Students enter semester and school year data to see the UAS Schedule they want to know. The system will retrieve data based on the input data, semester and school year entered, in the academic database. UAS schedule information will be displayed on the form See UAS Schedule. Sequence diagram process see UAS schedule shown in figure 8.

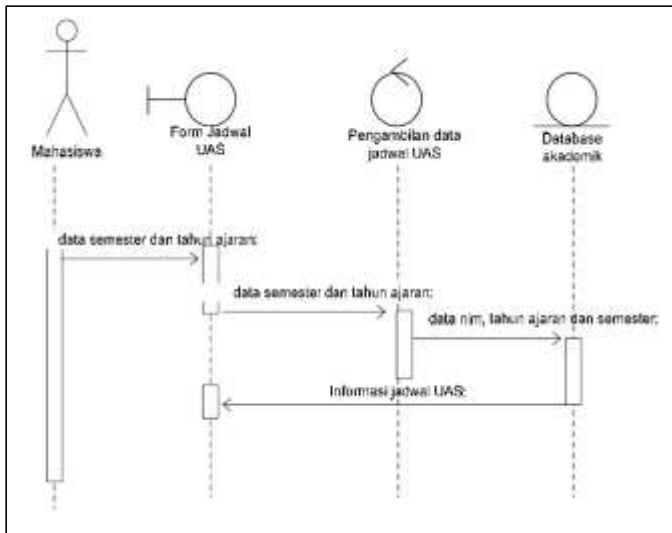


Figure 8. Sequence Diagram Proses Lihat Jadwal UAS

D. Sequence Diagram Proses Lihat Jadwal UTS

A sequence of the process Sees the UTS Schedule, after the login, the form dashboard will appear. Students choose the UTS Schedule menu on the form, the form will appear to See the UTS Schedule. Students enter semester and school year data to see the UTS Schedule they want to know. The system will retrieve data based on the input data, semester and school year entered, in the academic database. UTS schedule information will be displayed on the form See UTS Schedule. Sequence diagram process sees UTS schedule shown in Figure 9.

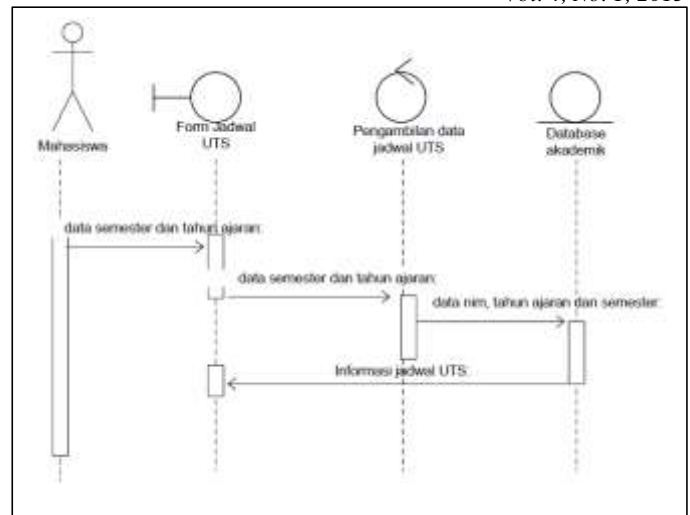


Figure 9. Sequence Diagram Proses Lihat Jadwal UTS

E. Sequence Diagram Proses Lihat KHS Semester

A sequence of the process View the Lecture Schedule, that is, after the login, the dashboard form will appear. Students choose the Semester KHS menu on the form, the form will see the KHS Semester. Students enter semester and school year data to see Semester KHS that they want to know. The system will check the input data, semester and school year entered, on the database academic. Semester KHS information will be displayed on the form See Semester KHS. Sequence diagram process sees KHS semester shown in Figure 10.

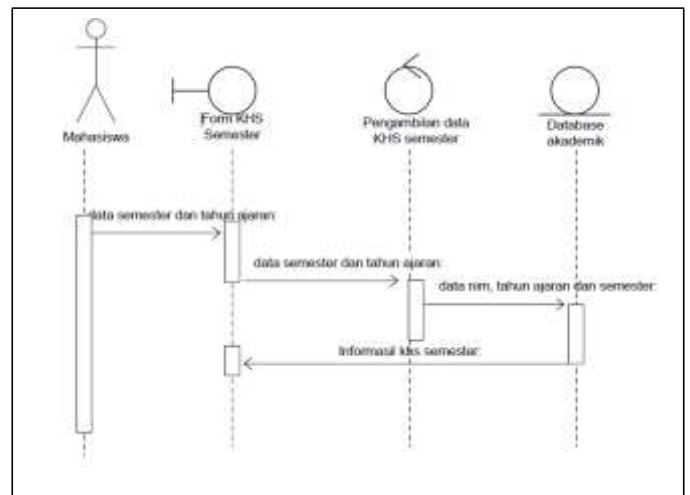


Figure 10. Sequence Diagram Proses Lihat KHS Semester

F. Sequence Diagram Proses Lihat KHS Kumulatif

A sequence of the process See cumulative KHS, namely after the login form, the dashboard form will appear. Students choose the cumulative KHS menu on the form, then the form will see the cumulative KHS. The system will check the student data, in the academic database. Information on the number of cumulative KHS will be displayed on the form See cumulative KHS. The process sequence diagram sees cumulative KHS can be seen in Figure 11.



form of View Lihat Sejarah IP. Sequence diagram process sees IP history can be seen in Figure 13.

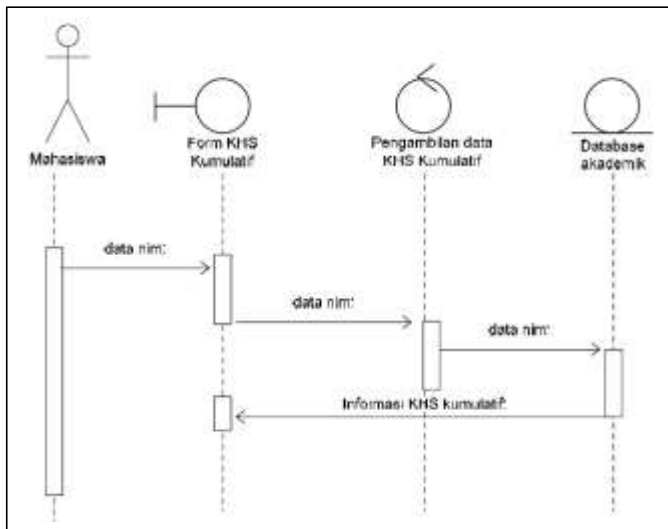


Figure 11. Sequence Diagram Proses Lihat KHS Kumulatif

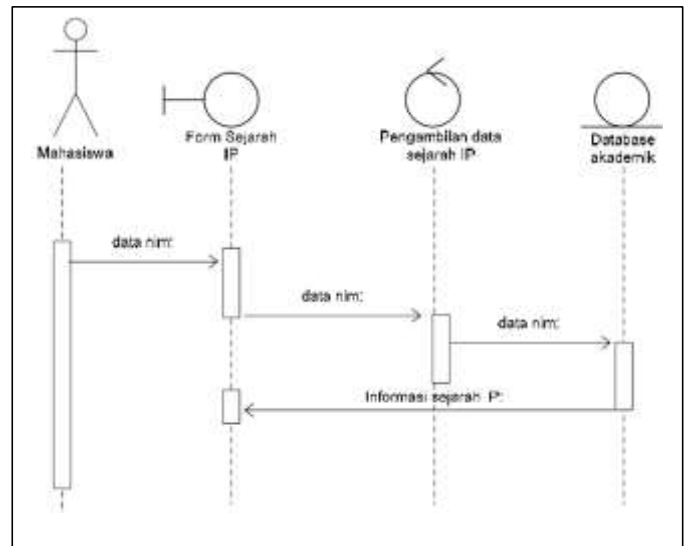


Figure 13. Sequence Diagram Proses Lihat Sejarah IP

G. Sequence Diagram Proses Lihat Presensi

A sequence of the Presence View process, named after the login, the dashboard form will appear. Students choose the Presence menu on the form, then the Form View Presence will appear. Students enter semester and school year data to see the Presence they want to know. The system will check the input data, semester and school year entered, in the academic database. The number of attendance information will be displayed on the View Presence form. The process sequence diagram sees presence can be seen in Figure 12.

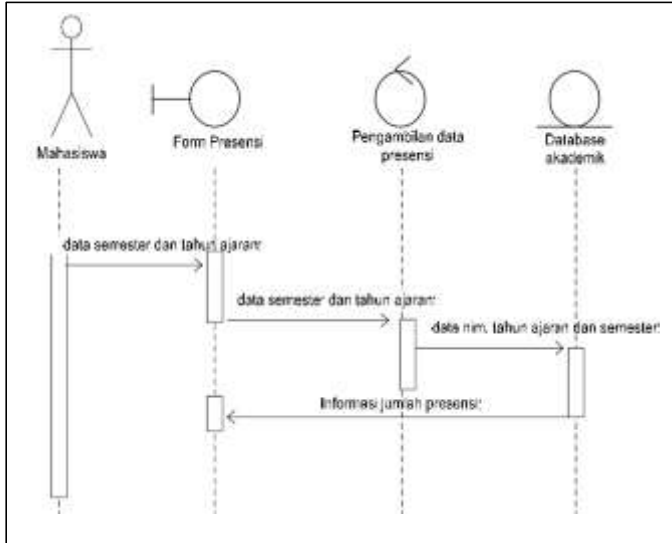


Figure 12. Sequence Diagram Proses Lihat Presensi

H. Sequence Diagram Proses Lihat Sejarah IP

A sequence of the process Lihat Sejarah IP that is after logging in, the form dashboard will appear. Students choose Lihat Sejarah IP menu on the form, the Presence form will appear. The system will check the student data, in the academic database Lihat Sejarah IP information will be displayed in the

VII. IMPLEMENTATION

The implementation phase is the stage of translating the design results into program lines. At this stage, a script is created to retrieve data that is on the server. In addition, writing programs with the Eclipse IDE starts. Writing this program using the Java programming language. For the design of the user interface using XML syntax. Local databases are implemented in the SQLite DBMS.

Figure 14 shows the results of the system implementation that has been made with the Eclipse IDE.

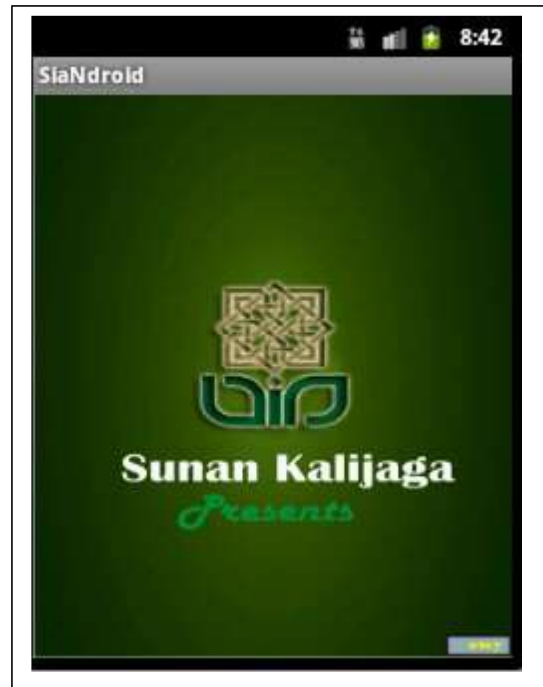


Figure 14. Implementation of the Splash Form



Based on the results of testing the system functionality as much as 100% of the respondents' answers stated that the functionality has been functioning properly. While the respondent's answer stating that functionality does not work does not exist.

For the results of testing the user interface, answers from respondents who stated strongly agreed were 38.67%. The number of answers that agree as much as 52%. A neutral answer of 9.33%. The answer does not agree does not exist. And the answer that states strongly disagree does not exist.

Thus, it can be concluded that the Academic Information System of Sunan Kalijaga State Islamic University is feasible to use, but there is still a need for further system development in order to obtain more optimal benefits.

VIII. CONCLUSION

Based on the research activities that have been carried out by the author in planning for implementation and testing, then some conclusions can be drawn as follows:

- 1) Successfully know the mechanism for retrieving academic data on the server.
- 2) Successfully display academic data in JSON format and can be read by android devices.
- 3) This research is able to develop academic information services at Sunan Kalijaga State Islamic University on the Android platform.

REFERENCES

- [1] H. Jumail, "Sistem Informasi Akademik Akademi Perawat (AKPER) Bethesda," Gajah Mada University Yogyakarta, 2005.
- [2] A. M. Lidinillah, "Sistem Informasi Akademik Fakultas Matematika dan Ilmu Pengetahuan Alam (MIPA) Universitas Gadjah Mada," 2008.
- [3] Agustin, "Sistem Inofrmasi Akademik Lembaga Pendidikan dan Pelatihan Ilmu Pelayaran Berbasis Wap," Gajah Mada University Yogyakarta, 2010.
- [4] Mulyadi, *Membuat Aplikasi Untuk Android*. Yogyakarta: Multimedia Center, 2010.

