CHAPTER III

OBJECT AND METHODS

3. 1 Object Research.

The object of research is a focus that is used in conducting a study, which made the object or focus of this research is on the E-Learning in the International Program UNIKOM running. Location and Campus UNIKOM way research is Dipatiukur No. 112-114-116 Bandung.

3.1.1 History The Company

The development of rapid information technology, to make the world in the 21st century is becoming increasingly transparent and seamless. Developments in science and information technology as well as issues of global trade and free trade should be anticipated by the college. Universities should have competitiveness. Indonesian Computer University has a vision to become a leading university in the field of computer and information technology, global perspective and become a center of excellence in the fields of science, technology and art of information that supports national development and oriented to the interests of the community, the nation and the state. Global perspective means to dare to compete with universities around the world. To get world class university currently has established UNIKOM international affairs office called the Office of International Affairs (AIO) Digital which is expected to increase the intensity of cooperation institutions, and increase motivation and interest in the academic community UNIKOM to take part at the international level through education, research and scientific publications, an exchange student and lecture. Establishment of the Office of International Affairs (AIO) UNIKOM was established by decree Rector No. 920 / SK / RECTOR / UNIKOM / IV / 2011, April 5, 2011 on the establishment and appointment of International affairs office bearers.

3.1.2. Organizational Structure of International Programs UNIKOM

Here is a structure Competitive Scholarship Organization business and Foreign Indonesian Computer University.

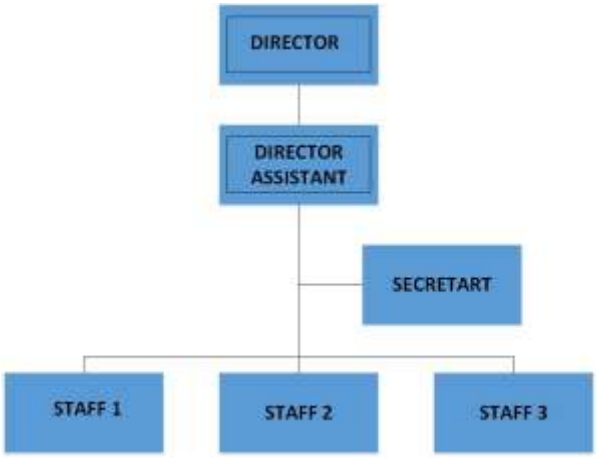


Figure 3.1 Organizational Structure of International Programs UNIKOM

3.2 Research Methods

The method is a mechanism, technique or how to seek, obtain, collect or record data that can be used for the purposes of preparing the study. The preparation of this research uses descriptive qualitative approach, which collects data and then analyze and explain the observations in the field.

3.2.1 Research Design

The study design included into the action research study nature (action research), which is the book (Gunawan, Rapoport, Associate cited 2006: 2007 Methodology action / action research), action research is an activity or something corrective action planning, implementation, and evaluation worked systematically and thus the validity and reliability achieve levels of research.

Action research is also a process that includes a cycle of action, which is based on the reflection; feedback proof (evidence) and evaluation of the previous action and current situation.

3.2.2 Types and Data Collection Methods

The type and data collection methods are as follows:

3.2.2.1 Primary Data Sources.

Sources of data or information of this research is based on the type of data required. Primary data is data obtained directly from the respondents collected through field surveys using a specific data collection techniques made specifically for it. Data collection techniques in order to collect information about the object of this study, namely:

1. Methods of Observation

Direct researchers visited the study site to the company that made the object of research is UNIKOM. This is done for a close look at the problems associated with the required subject in this study.

2. Interview

Is a technique of data collection by face to face between collecting data and sources in question..

3.2.2.2 Secondary Data Source

Types of secondary data, the data obtained from existing documentations in the company. Done by examining secondary data used to support, complement and enhance primary data, obtained from the company documentation, internet, and data from the company, as well as the results of previous studies related to the problem in this study.

3.2.3 Method and System Development Approach.

In this section will explain the approach, the development of systems, methods of analysis and design analysis tools. Following is a description of the approach and system development.

3.2.3.1 Systems Approach Method

The method the researchers used a systems approach is to use object-oriented systems approach are in visualized with UML (Unified Modeling Language) and are as follows: Use Case, Activity Diagrams, Sequence Diagrams, Class Diagrams, collaboration Diagram, Component Diagram, and Deployment diagrams. According to the US Rosa, M. Shalahudin, Software Engineering, 2013: 103, object-oriented approach is a technique or approach in looking at the problems in the system (system software, information systems, or other systems). Object-oriented approach will be developed as a collection of objects corresponding to the object - the object of the real world.

3.2.3.2 Systems Development Method

The method used in the research is to develop a scheduling system that is using a prototype model. According to the US Rosa, M. Shalahudin, Software Engineering, 2013, frequent customer to imagine a collection of demands but not specified in detail in terms of inputs , process, and output. On the other hand a software developer must specify in detail the requirements of a technical point where customers often do not understand about these technical matters.

Prototype model can be used to connect a customer misunderstanding regarding technical issues and clarify the customer's requirements specification to software developers. Prototype models starts from gathering customer requirements for software to be created. Then made a prototype program that is imagined with what customers really want. The prototype program is usually a program that is not yet finished. These programs usually provide a display with the flow

simulation software so that it looks like a ready-made software. The prototype program is evaluated by the customer or user to find the specifications in accordance with the wishes of the customer or user. Here is a picture 3.2 of a model prototype :

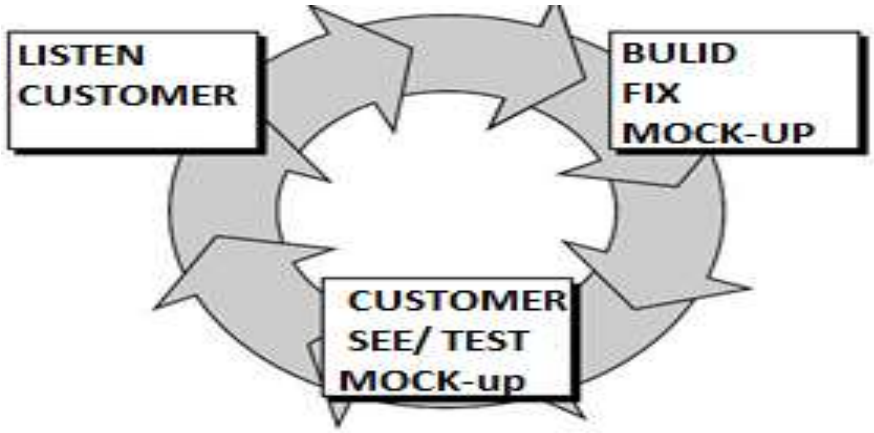


Figure 3.2 Prototype model

(Source: Rosa A.S, M. Shalahudin, 2013:32, Rekayasa perangkat lunak,Terstruktur dan berorientasi objek,penerbit informatika bandung)

Mock-up is something that is used as a design model that is used for teaching, demonstration, evaluation design, promotion, or other purposes. A mock-up is referred to as a prototype software if available or able to demonstrate most of the functionality of software systems and allows testing of software systems design. Iteration occurs in the manufacture of prototypes up in accordance with the wishes of the customer. Along with developing a prototype of the actual software system is developed also to fit the needs of the customer or user.

Stages - steps being taken in the design and implementation of scheduling courses in the International Programme is :

1. **Listening Customer**

   The first stage of this method is to listen to customers which collects data - data on the system needs to be created. This stage begins by gathering the requirements needed to make the process of scheduling a course in International Programs.

2. **Building prototype.**

   After getting the requirements needed to make a prototype, the next step to do is to build a prototype stage repair is done by making the overall system to be completed based on the analysis of the needs that have been done before.

3. **Customers testing prototype**

   The final phase of this prototype model is the testing phase. Tests performed by the user of the system. The testing phase is done to get a response to a system that has been created. The third process is done repeatedly, to get satisfaction from the customer on a system that has been created. Process undertaken should be in accordance with the order.

3.2.3.3 Analysis and Design Tools

With a systems approach that is object-oriented, then the author will be a portrait of how the characteristics of the system by using a modeling called the Unified Modeling Language (UML), According to Rosa USA, M. Shalahudin, Software Engineering, 2013: 133 & 140, UML is one of the standard language which is widely used in the industry to define requirements, making the analysis and design, as well as describe the architecture of object-oriented programming.

1. **Use Case Diagram**

With a systems approach that is object-oriented, then the author will be a portrait of how the characteristics of the system by using a modeling called the Unified Modeling Language (UML), According to Rosa USA, M. Shalahudin, Software Engineering, 2013: 133 & 140, UML is one of

the standard language which is widely used in the industry to define requirements, making the analysis and design, as well as describe the architecture of object-oriented programming.

2. Activity Diagram

According to the US Rosa, M. Shalahudin, Software Engineering, 2013: 161, Diagram activity or activity diagram illustrates the workflow or the activity of a system or business process or menu in the software. Noteworthy here is that the activity diagram illustrates the activity of the system is not what actors do, so activities can be performed by the system.

3. Sequence Diagram

According to the US Rosa, M. Shalahudin, Software Engineering, 2013: 165, Diagram sequences or sequence diagram illustrates the behavior of objects in use case by describing the life time of the object and the message that is sent and received between objects. Therefore, to describe the sequence diagram objects must be known to be involved in a use case along with the methods of the class owned diinstansiasi become the object. Creating a sequence diagram is also needed to look at the existing scenario in use case.

4. Collaboration Diagram

Collaboration diagrams are another form of sequence diagrams, sequence diagrams which are organized by time, while collaboration diagrams are organized according to the room / space.

5. Class Diagram

According to the US Rosa, M. Shalahudin, Software Engineering, 2013: 141, grade or class diagram is a diagram depicting the structure of the system in terms of defining the classes that will be made to build the system. Classes have what are called attributes and methods or operations. Attributes are variables owned by a class, operations or methods are functions that are owned by the class.

The class diagram is made so that the programmer or progammer make appropriate design classes in the class diagram that the design documentation and software synchronous.

6. Component Diagram

According to the US Rosa, M. Shalahudin, Software Engineering, 2013: 148, Diagram components or component diagram is made to show the organization and dependence among a collection of components in a system. Diagram component focuses on components and systems needed in the system.

7. Deployment Diagram

According to the US Rosa, M. Shalahudin, Software Engineering, 2013: 154, Diagram deployment or deployment diagram showing the configuration of the components in the process of execution of the application. Deployment diagram can also be used to model such things, additional systems (embedded systems) that portray the device design, nodes, and hardware.

3.2.4. Testing Software

There is a lot of testing techniques that can be used to test the software, including: Testing Black Box and White Box Testing. As for software testing that is done in this study is the Black Box, According to US Rosa, M. Shalahudin, Software Engineering, 2013: 275, Black Box Testing is to test the software in terms of functional specifications without test design and code program. The test is intended to determine whether the functions, inputs, and outputs of the software according to the required specifications. Black box testing is done by creating test cases that are tried all the functions by means of software for compliance with the required specifications. Test cases are created to perform black-box testing should be made to the case of right and wrong cases, for example in the case of the login process, the test cases are created are:

1. If the user enter a user name and password are correct.
2. If the user enter a user name and password is wrong, for example, the user name correctly but the password is wrong, or vice versa, or both are wrong.

The characteristics of Black Box Testing is as follows:

1. Black Box Testing focused on the functional requirements on the software, based on the specification requirements of the software.
2. Black Box Testing is not an alternative technique than White Box Testing. More than that, he is a complementary approach to include errors with different classes of White Box Testing method.
3. Black Box Testing testing without detailed knowledge of the internal structure of a system or component tested. also referred to as behavioral testing, specification-based testing, the input / output testing or functional testing.

2.2.5. Analysis of Current System

Analysis of the system running the decomposition activity of a complete information system into components that aim to identify and evaluate the problems that arise, obstacles that may occur and the expected needs, so as to propose improvements will performed on the system.

2.2.5.1. Analysis of Document

Analysis of the document is to analyze the activities of all documents that are used on the basis of an information system that is running. As for the types of documents used in the course scheduling system that is running that is news event scheduling (BAP), the task of teaching and teaching duties of office activity, class schedules, room data, and the data forces the International Student Program. Here are the details of each of these documents:

Table 3.1 Table Document analysis

NO	DOCUMENT NAME	COMMENTARY
1	Minutes Scheduling (BAP)	**Description:** Documents containing information about the event classes created by the secretary Prodi SI and given to the secretary of the International Program and submitted to the Vice Rector 1. **Function:** As the minutes of the lecture. **Source:** secretary Prodi SI. **Attribute:** Date, courses, credits, semester, classes / courses, study programs, day, time, space, matter, student name, ID(NIM), signature .
2	Teaching Duties	**Description:** Documents containing information about the task of teaching for Lecture LB. **Function:** As a teaching assignment information for lecture LB. **Source:** secretary Prodi SI. **Attribute:** Name of lecturer, NIP, courses, credits, semester, classes / courses, study programs, day, time, space
3	The task of teaching and office activities	**Description:** Documents containing information on the tasks of teaching and lecture office activity remains. **Function:** As a teaching assignment information for tenured lecture and office activities. **Source:** secretary Prodi SI. **Attribute:** Name of lecturer, NIP, Prodi, hours, days .
4	Lecture Schedule	**Description:** Provide information about the lecture schedule. **Function:** To find a course, the time and space to be occupied. **Source:** secretary Prodi SI. **Attribute:** Class, semester, course, day, hour, courses, credits, lecturers, space .
5	Document Room	**Description:** Provide information about the data room and room availability. **Function:** Knowing the data room and room availability. **Source:** secretary Prodi SI.

		Attribute: Space, hours, days .
6	International program student force document	**Description:** Provide information about the data forces the International Student Program. **Function:** Knowing the students of the International Program of data generation. **Source:** secretary Prodi SI. **Attribute:** Class, semester, year.

3.3 Analysis of current procedures.

Analysis of the current procedures aim to find out more clearly how the workings of the system and know the problems faced by the system can

be used as a foundation for the design of the proposed new system. The analysis of scheduling procedure that is running in the International Program UNIKOM is as follows:

3.3.2.1. Use Case Diagram E-Learning The Ongoing

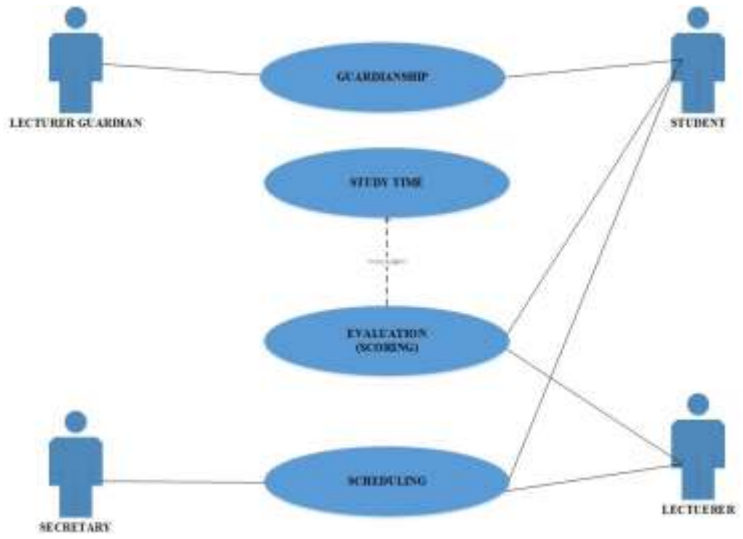


Figure 3.3 Use Case Diagram E-Learning the Ongoing

3.3.3.2. Scenario Use Case Diagram E-Learning The Ongoing

The Scenario Use Case Diagram that is running is as follows:

1. Scenario Use Case Diagram Guardianship.

The scenario of a use case diagram guardianship subjects in the current system is as follows:

1 Use Case Name: Guardianship.

2 Main Actor: Guardian Lecturer, Student.

3 Purpose: Fill the selected course during the semester in progress.

Table 3.2 Scenario Use Case Diagram Guardianship The Ongoing

Guardian Lecture	Student
1.Provide guidance on the subjects that are to be retrieved at the time of the semester in progress.	
	2.Guidance courses to be retrieved
	3.Fill out the list of subjects that you want to select.
4.Signing a list of subjects that have been chosen by the student.	
	5.Submit a list of subjects to the department staff
Alternative scenario	
6.Do not sign the list of subjects chosen by students.	
	7.Fixing the list of subjects that have been.
1.Provide guidance on the subjects that are to be retrieved at the time of the semester in progress.	

Scenario Use Case Diagram Evaluation

The use case scenario diagram ongoing assessment is as follows:

Table 3.3 Scenario use case Evaluation system the Ongoing

Lecture	Student
1.Lecturer go to the class on the time which is on the schedule.	
	2.Student attends the class on the time that has been mention in schedule.
3.Provide quizzes, assignments, midterms (UTS) and final exams (UAS) to students	
	4.Working quizzes, assignments, midterms(UTS) and final exams (UAS).
	5.Submit the results of quizzes, assignments, midterms(UTS) and final exams (UAS).to the lecturer concerned
6.Conduct an assessment by calculating the value of quizzes, assignments, midterms(UTS) and final exams (UAS).. 7.Submit the value to the department staff.	.
Alternative Scenario	
8.Make improvements value if there is.	
	9.Do not get the final value. 10.Perform repair value

2. Scenario Use Case Diagram Scheduling.

The scenario of a use case diagram guardianship subjects in the current system is as follows:

1 Use Case Name: Scheduling

2 Main Actor: Lecturer, Student, Secretariat of department

3 Purpose: To set lecturer course ongoing flood

Table 3.4 Scenario use case diagram scheduling the ongoing

Lecture(Fixed, LB, Services) + Student	Secretary Prodi SI
	1.Offer subject to permanent lecturers and professors create a mapping for LB and Services
2.Receive quotes subjects, such as the bidding documents subject	
	3.Receive quotes subjects 4.Make BAP, Tasks and Duties Teaching Activities Office and handed it to WR1 5.Receive validation or approval dossier, Tasks & Duties Teaching Activities Office of WR1 and distribute to Lecturer.
6.Lecturer receive BAP, Tasks & Duties Teaching Teaching Activities Office of the Secretary Prodi SI.	
	7.Print the lecture schedule And given to the staff department for students in pairs clipboard announcement
8.Student receives the schedule	
Alternative Scenario	
9.Reject offers courses	
	10.Receive a prompt denial of subjects. 11.Not receiving validation BAP, Tasks & Duties Teaching Teaching Activities Office of WR1. 12.Do not print the lecture schedule

2.3.2.3. Activity Diagram System The Ongoing

In this section will be described in the documentation workflow system that is running on the system UNIKOM E_Learning International Program which aims to see the flow of the running system processes.

The activity - activity E_Learning International system that is running at the moment is as follows:

1. Activity Diagram Guardianship the Ongoing.

This section describes the documentation workflow on a running system that aims to see the flow of the current system.

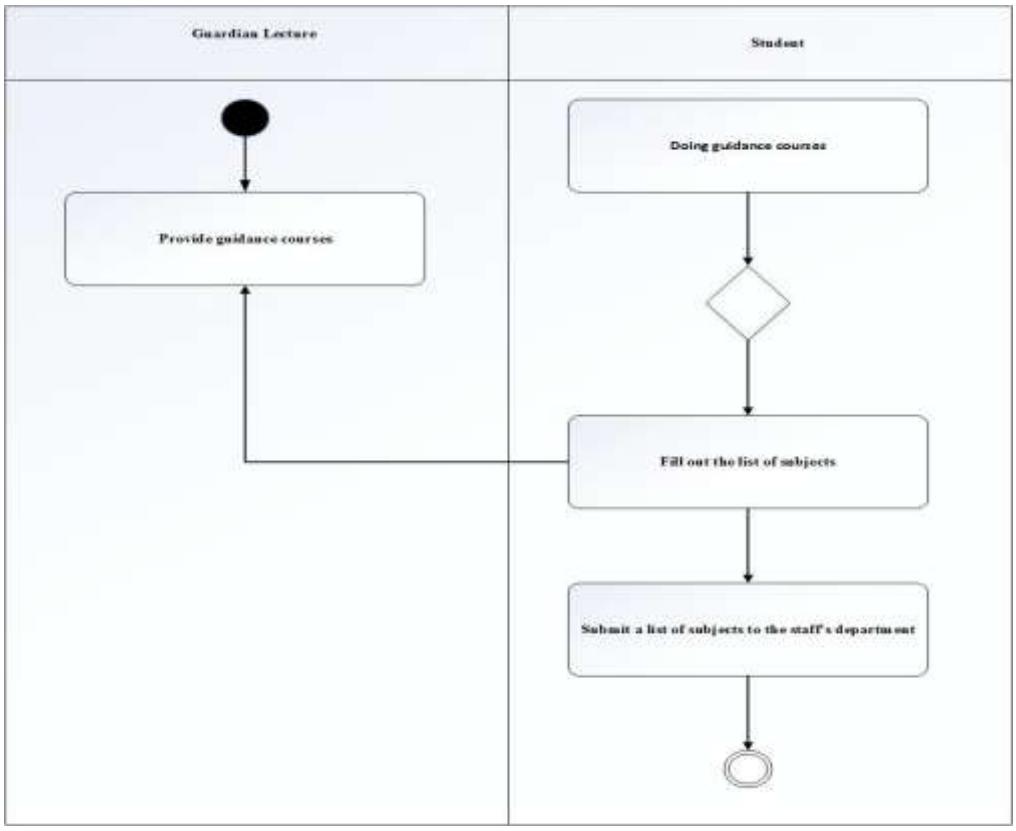


Figure 3.4 Activity Diagram Guardianship The ongoing

The image above describes the flow system that runs on the International Trusteeship Program UNIKOM. Each lecture before the beginning of the semester, Lecturer Guardian will provide guidance to the students of the International Program for explaining each course that will hold International Student Program. International Student Program will be provided by the department staff on the list of subjects to be taken each semester. Then select each course in the list of subjects to be retrieved and handed to the staff of the Department.

2. Activity Diagram Scoring The Ongoing

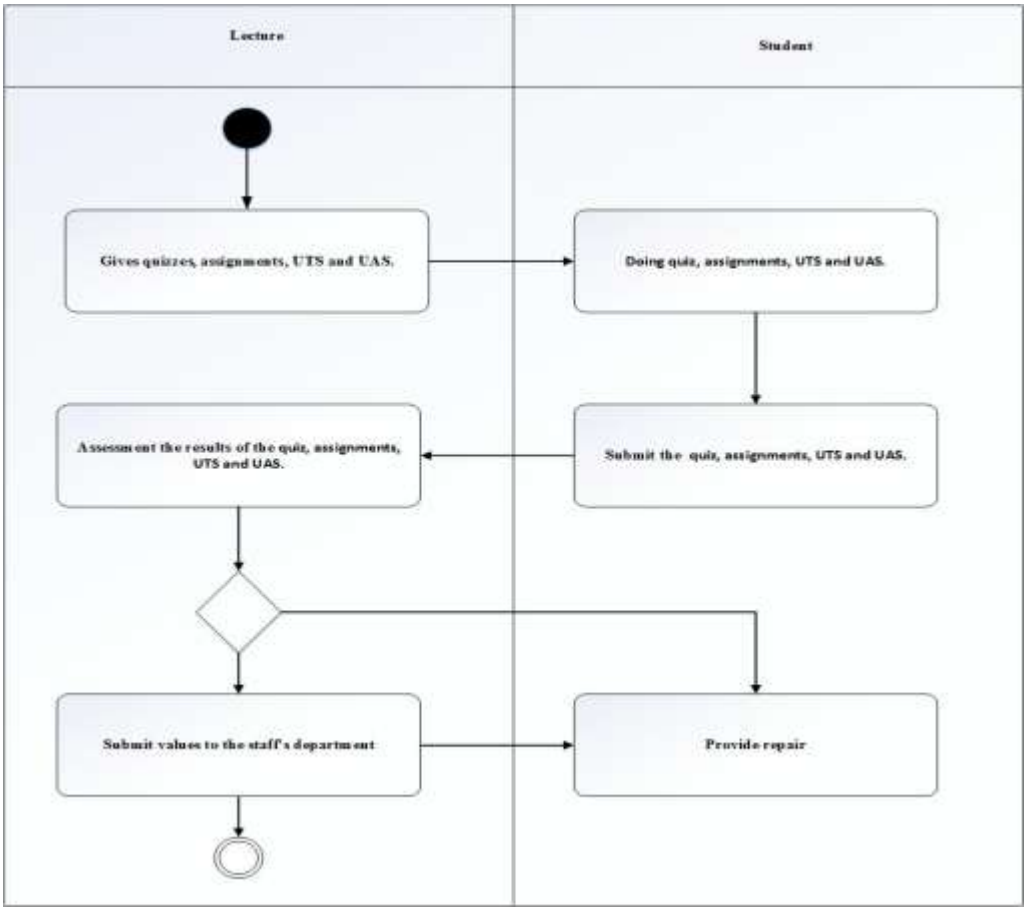


Figure 3.5 Activity Diagram Scoring The Ongoing

The image above describes the flow in International Assessment Program, which tenured faculty, outstanding service and provide an assessment in the form of quizzes, assignments, midterms (UTS) and final exams (UAS) to students, then students will be working on the assessment and to give back to the lecturer concerned. After that, the lecturer will assess the results of student submitted by both quizzes, assignments midterms (UTS) and final exams (UAS). And will be submitted to the department staff in the form of a list of results of students' final grades International Program.

3. Activity Scheduling The Ongoing

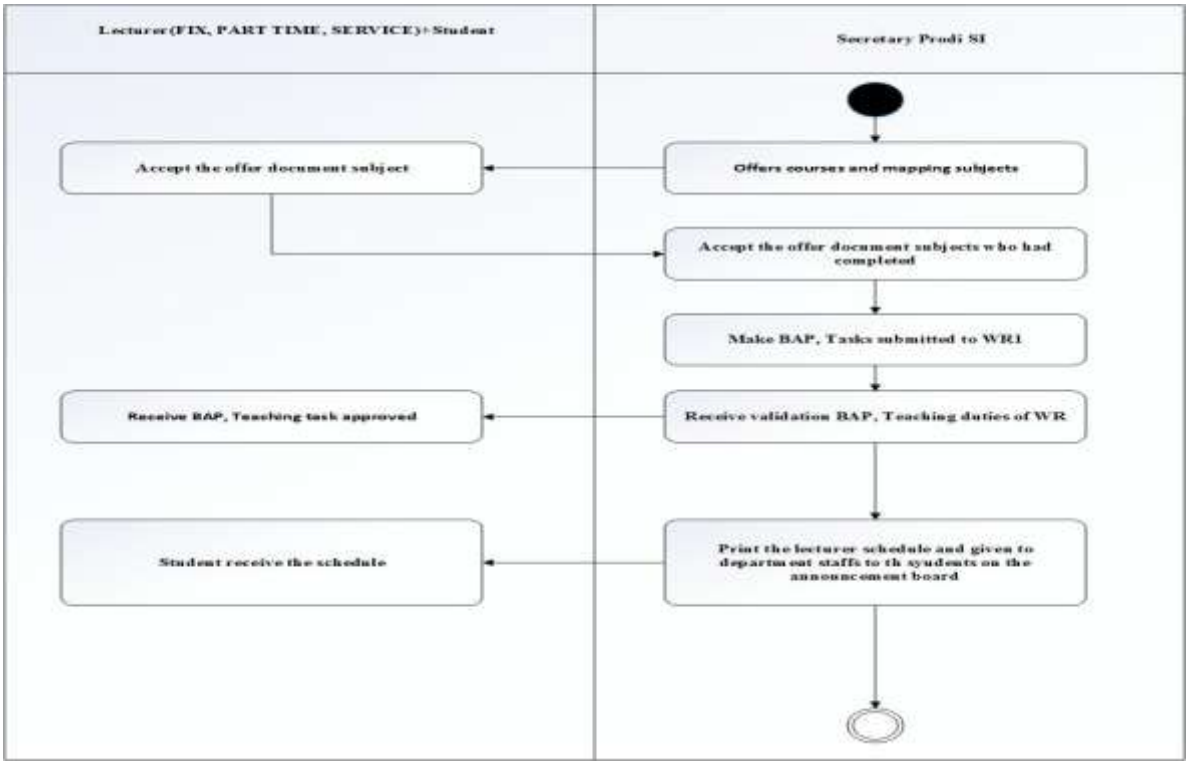


Figure 3.6 Activity Diagram Scheduling The Ongoing

The image above describes the flow scheduling conducted by the Secretary Prodi SI begins with offering courses and mapping the course to tenured faculty, service or faculty LB, then the lecturer will confirm the offer. Once confirmed, the Secretariat will make BAP SI Prodi, Task Teaching & Task teaching activities office and submitted to the WR1 to be validated. Once validated by WR 1 Then BAP, Tasks & Duties Teaching Activities Office will be submitted to the lecturer concerned. And Prodi SI Secretariat will print the schedule and will submit it to the department staff.

3.3.3. Ongoing Evaluation System

After passing through several stages of analysis of E-Learning system that is running in the International Program UNIKOM, it can be seen that there are deficiencies in the system, these shortcomings depicted in the following table:

Tabel 3.5 Evaluation System the Ongoing

No	Problem	Part	Settlement plan
1	Making a schedule is still done manually.	Secretary Prodi	Creating an application in which there is a menu that can generate all of the functions that exist in the application that will provide easy access to scheduling courses for both the User or Client and Admin.
2	Making existing class schedule often spend considerable time because the existing system only checks the clash, not improve or construct the course schedule	Secretary Prodi	With this application can minimize collision course because all of the data subjects are processed through a web server accessed by admin.
3	Especially for students who want to know the schedule or change the course schedule, distances sometimes make students constrained by time to determine a course of sudden schedule changes.	Student	Creating a new system that will be web based lectures for student schedules displayed web pages that can be accessed and can facilitate students to access course schedule anytime and anywhere with no problems distance and time.
4	Difficulty providing material, a task in the form of files to students	Lecture	Creating systems that provide facilities where faculty can upload files into the system and can be accessed by students or download files sent by the student.
	Difficulty in giving the value of the end of the course to the course which is being held	Lecture	Provide automatic assessment facilities so that lecturers have just input the value of each component of the generated automatically and will value the

			outcome of each course and can be accessed by students.
	Difficulties in obtaining information of international students who are taking courses in the semester course whatever, ongoing	Guardian Lecture	Provide custody facilities between faculty and students so that professors know the progress of the child guardian who is attending lectures during the semester in progress