Object Oriented Analysis Design for Vocational Graduates Search Applications Using UML Modeling

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Abstract. One of the sectors to strengthen vocational education is conducting graduate searches. The aim is to map or find out the activities of alumni after graduating from school. The extent to which the competency of alumni obtained from the school can be absorbed and needed by industry. Several systems are in place that allow for completion of tracing. However, not all of these systems meet the school's desired needs. So it is necessary to design the system by adjusting the needs of the school. In the early stages of the research conducted a series of needs analysis to determine system specifications. One of them is object-oriented programming analysis design using UML modeling by applying four UML diagrams, namely class diagrams, activity diagrams, use case diagrams, and sequence diagrams.

Keywords: Tracer Study, UML.

1 Introduction

Based on the National Education System Law no. 20 of 2013 the purpose of vocational education is to prepare competent students or experts in certain fields. The Ministry of Education and Culture through the Directorate General of Vocational Education (Ditjen Diksi) is intensifying the Tracer Study program. One of the benefits is that schools can evaluate graduate competencies which have an impact on curriculum reviews and teaching staff.

Therefore, this research was conducted as an alternative solution to the tracer study management of SMK in the form of designing a Web-based system application using four UML diagrams modeling, namely class diagrams, activity diagrams, use case diagrams, and sequence diagrams. found in UML diagrams.

2. Research Methods

The Waterfall model is a wrong method in system or application development. Starting from the very top stage, namely requirements analysis, system design, program code writing, program testing and program implementation stages.
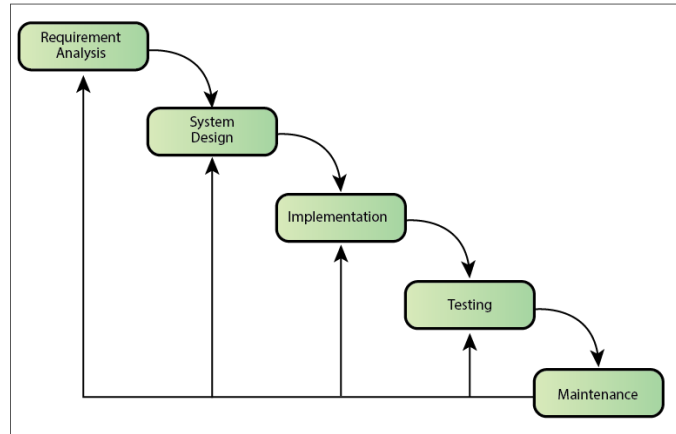
Figure 1. Waterfall model

In this study, it is limited to the system analysis stage using the UML model and interface design. Below is a flowchart diagram as a research method flow.
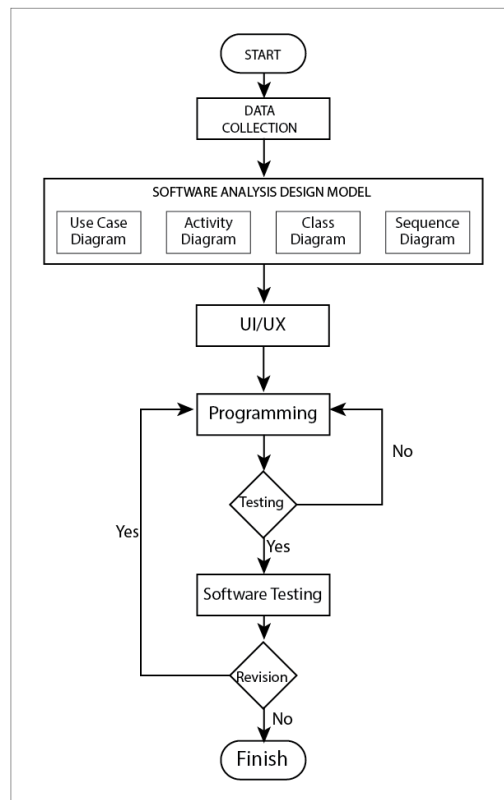

Figure 2. Research Method Flowchart

In the flowchart above, the interview phase begins and data collection in the form of correspondent data (alumni) and questionnaire data. Next is to design four UML diagrams, namely class diagrams, activity diagrams, use case diagrams, and sequence diagrams.

3. Result and Discussion

The results of this study are system flowcharts, analysis of UML modeling designs in the form of four UML diagrams and UI/UX designs.

A. Unified Modeling Language (UML)
1. Use Case Diagrams
   This diagram includes the stages, namely
   a. Definition of Actor
       Actors are divided into two, namely admin and respondent

Tabel 1. Aktor

No	Actor	Definition
1	Respondents Alumni	Vocational students who have graduated from school and are already working or continuing education or are entrepreneurship independently
2	Tracer Study Admin	The person who has the task of making a list of prospective alumni respondents and submitting the results of the recapitulation of filling out the tracer study questionnaire by alumni respondents.

   a. Definition of Actor of Use Case
       There are 18 use case definitions, namely

Tabel 2. Definis Use Case

No	Use Case	Definition
1	Validation	is the process of determining who has the right to access and manage tracer data. In general, by granting access rights to both actors by logging in, and logging out.
2	Login	Namely the process of logging in (entering the application) by selecting the actor/user category, namely alumni or admin.
3	Logout	Logout That is the process of logging out (exiting the application) by each actor.

4	Managing Tracer Study	That is the process of managing a tracer study with three main activities, namely filling out questionnaires, displaying a recapitulation of poll results and determining a period containing a list of prospective alumni respondents who can fill out questionnaires based on period.
5	Filling out the Tracer Study Questionnaire	That is the process of alumni respondents filling out questionnaires based on the instruments that are already available in the application
6	Displaying a poll recapitulation	That is the process of displaying a recapitulation of poll results that have been filled out by respondents
7	Managing Periods	That is the process of determining the period as a category of prospective respondents. The period is in the form of the alumni graduation year.
8	Managing Respondent Data	That is the process of determining prospective respondents who can fill out the tracer study questionnaire.
9	Managing Admin Accounts	That is the process of managing changes to the admin email and password.
10	Adding Period	That is the process of creating a new period into the database
11	Changing Period	That is the process of changing the name of the period contained in the database
12	Deleting Period	Deleting Period That is the process of changing the name of the period contained in the database
13	Displays Period	Displaying Period That is the process of displaying the entire period stored in the database
14	Looking for a Period	That is the process of searching for all periods stored in the database
15	Adding Respondent Data	That is the process of creating new alumni respondent data in each period into the database
16	Changing Respondent Data	That is the process of changing the name of alumni respondents contained in the database
17	Deleting Respondent Data	That is the process of changing the name of the alumni respondent contained in the database

18	Displaying Respondent Data	That is the process of displaying all alumni respondents stored in the database
19	Finding Respondent Data	That is the process of searching for all alumni respondents stored in the database

b. Use case Diagram

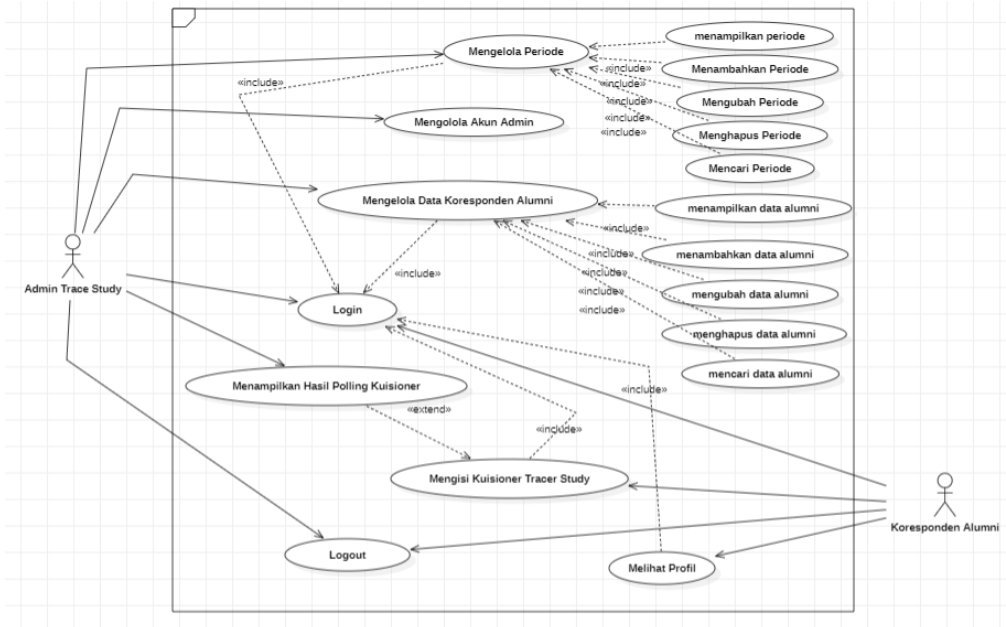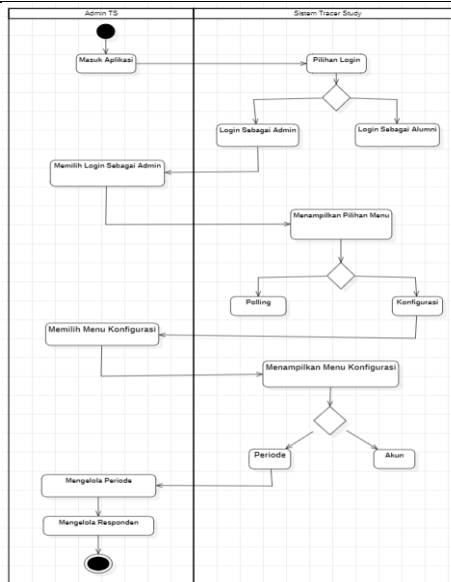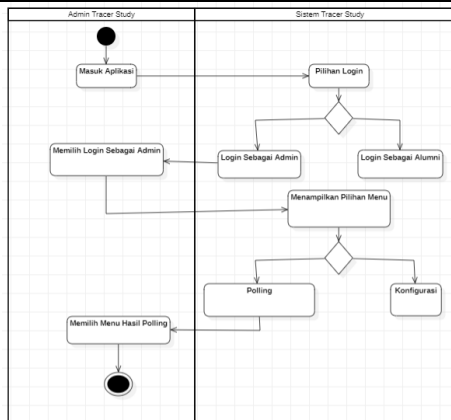The following is a use case diagram consisting of 2 main actors.

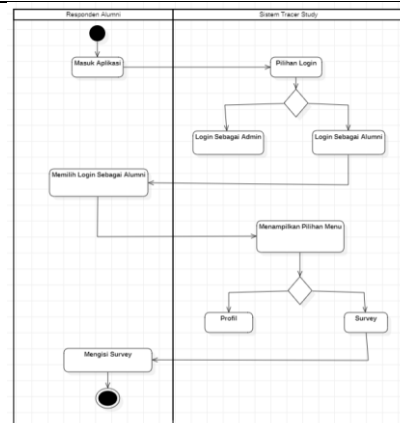Figure 3. Use Case Diagram

2. *Activity Diagram*

Activity Diagram of Managing Periods and Respondents	
Activity Diagram of Viewing Polls	

Activity Diagram of Filling Tracer Study Questionnaire	

3. *Sequence Diagram*

Sequence Diagram managing periods and respondents	
Sequence Diagram Showing Polls	
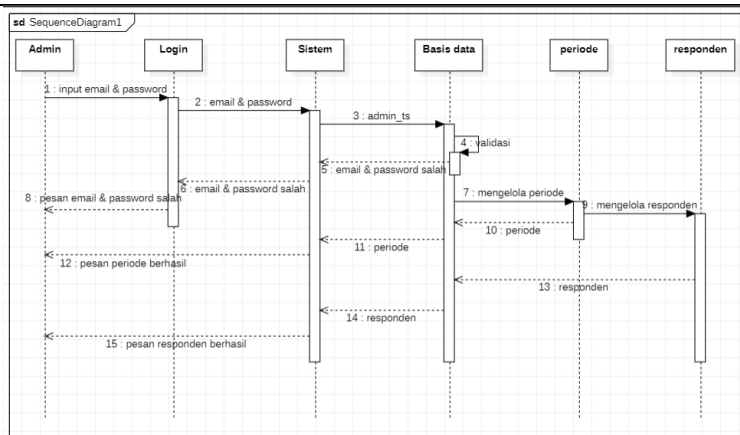
Sequence Diagram filling out the questionnaire	
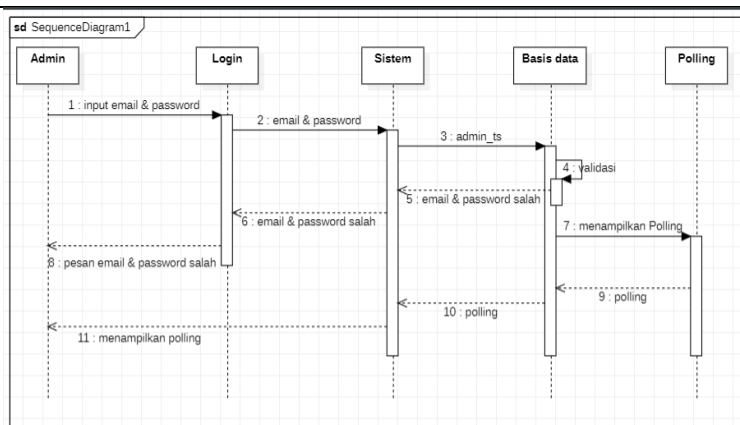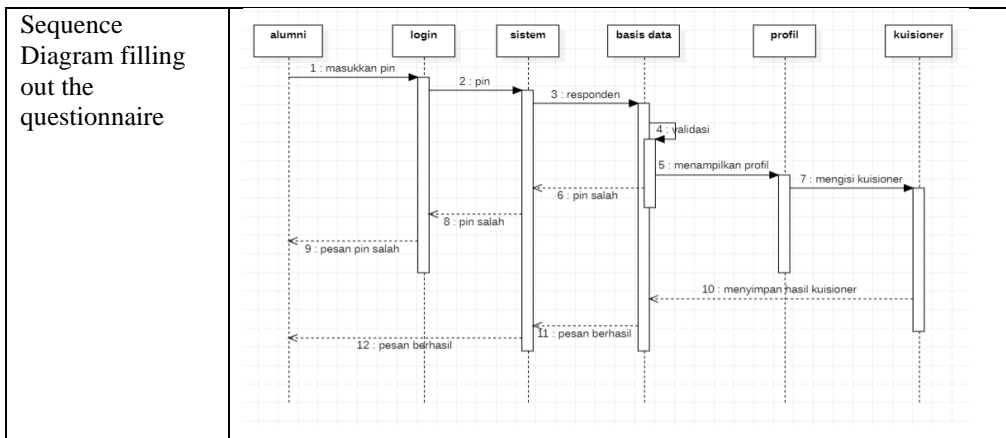
4. Conclusion

In general, this research has direct benefits, namely helping the process of developing a trace study application life cycle, especially as an initial design before the system implementation stage, namely coding. And the indirect benefit is as a tool for mapping the absorption of SMK graduates in the industry.

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