Journal of Computer Networks, Architecture and High Performance Computing
Volume 5, Number 1, January 2022
https://doi.org/10.47709/cnahpc.v4i1.1148

Submitted : Nov 02, 2021
Accepted : Jan 25, 2022
Published : Jan 27, 2022

Development Of E-Research Information System To Support Research Management (Case Study of Wastukancana University)

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ABSTRACT

E-research management is an implementation mechanism of information and communication technologies on the research management so that the research runs effectively and efficiently. E-research STT Wastukancana is an information system for submission of a thesis title and undergraduate internship but there are still many incomplete features, so it needs system development so the system can run well. Therefore author does the development system of e-research STT Wastukancana Web-Based so that admin, students, and lecturers can carry out business processes well on online system mode. The result of this research is an information system that can help out and ease users in doing business processes and information around e-research STT Wastukancana.

Keywords: Information System, E-research

INTRODUCTION

Research is a mandatory thing for higher education institutions as required in Law 20 of 2003 concerning the National Education System Article 20 paragraph (2) which reads: "Universities are obliged to carry out education, research, and community service numbers". The implementation of research in higher education is further regulated in Law number 14 of 2005 concerning Teachers and Lecturers article 60 point (a) which reads: "In carrying out professional duties, lecturers are obliged to: carry out education, research, and community service".

According to Monash University, E-research is a University commitment to accelerating research by applying advanced computing and information technology to important research problems. The center partners with individual researchers, Australian research institutions and facilities, and global research communities. (Monash University, n.d.)

E-Research is a system that is used for the administration of scientific journals, research, and community service. (I Gede Suardika, 2015)

The biggest benefit of designing this thesis management system application is that students can easily submit thesis titles, guide with supervisors, get information about seminar schedules, seminar results, comprehensive schedules, and so on without being limited by space and time. On the other hand, the campus or study program has a thesis bank database that is useful for filtering new titles submitted by students so that there are no similarities or plagiarism in addition to getting the required reports. (Sapna et al., 2020)

STT Wastukancana Purwakarta is a university located in the city of Purwakarta. This university has an E-research information system as a means of academic support.

The E-research information system at STT Wastukancana is an information system used by students to submit practical work and thesis submissions, but the information system does not meet user needs and there are still many incomplete information systems features.

The incomplete features include:

- There is no topic bid feature.
  This feature is used by lecturers/admins to create a thesis title which will be given to students who want to take the title.
- The practical work submission module and the thesis submission module are not yet one system.
  To keep the number of scientific journal publications increasing in Indonesia, especially in universities, in addition to promoting research activities through grant or incentive programs, a facility is also needed that makes it easier for universities, in this case, researchers, to carry out their research activities. This

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convenience is deemed necessary considering that research administration is not easy for researchers to do. For this reason, it is necessary to create an application by utilizing information technology called the E-research Information System.

LITERATURE REVIEW

An information system that combines information technology with the activities of those who utilize it to support operations and management. The concept "information system" is frequently used to refer to the interactions between people, algorithmic processes, data, and technologies in a wide sense. In this sense, the statement refers not just to how businesses employ information and communication technology to support business, as well as to how humans behave of technologies to support the activities. (Romindo et al., 2021)

E-Research is the term applied to the use of advanced information and communication technologies (ICT's) to the practice of research. Key areas include collaboration, computation (including high-performance computing), visualization, research data management, and tools. (CQUniversity Australia, n.d.)

Using E-research Tools to Improve Research Outcomes E-research Tools allows researchers to increase their research output and research quality through:

a. Improved Collaboration
   Sharing Data; Virtual Meetings/Presentations
b. Utilising Local, State, and National IT Infrastructure
   Scientific Instruments; Data Services; Web Services, Portals, and Systems
c. Accessing Data Repositories and Collections
   Artistic; Astronomy; Biological; Climate; Genome; Historical; Oceanographic.
d. Utilising Advanced Computing Facilities.
e. Perform greater Computer Simulations; Conduct larger Searches
f. Managing and reusing research data.
   Metadata systems, data storage, and preservation.

USDP is a methodology for software development, especially object-oriented software. This methodology was first introduced by the Rational Team, which in its subsequent development was refined again into a new methodology called the Rational Unified Process (RUP), which at the same time became the forerunner to the formation of approximately seven other methodologies. (Nugroho, 2010).

UML (Unified Modeling Language) is a modeling 'language' for systems or software with an object-oriented paradigm. Modeling is used to simplify complex problems in such a way that they are easier to learn and understand. (M Teguh, 2018).

METHOD

At this stage, the authors collect data using two types of data as follows:

- Primary Data The methods used to obtain primary data are as follows:
  a. This observation is carried out directly to see or observe what is in the object of research.
  b. Direct interview with the admin of the E-research information system.
- Software Development Methods

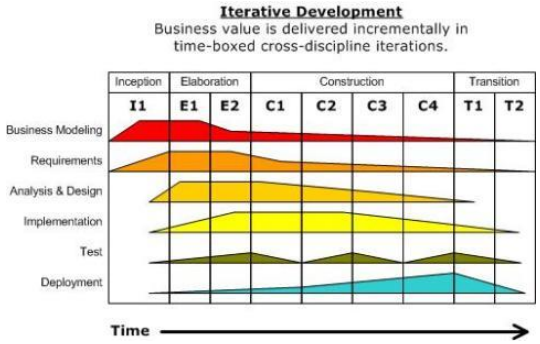

Figure 1 USDP Method

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RESULT

Inception

In this phase, software developers are required to be able to interact with customers, as a first step to identify the system requirements to be made. This step is quite important so that software developers have a common perception between the system to be made and the needs of users.

In this phase, the writer analyzes the current E-research information system and looks for what features should be developed in the E-research information system.

After the author did the analysis, it turns out that the E-research information system still has many features that must be developed including:

- There is no topic bid feature.
  This feature will be used by lecturers/admins to create a thesis title, which will be given to students who want to take the title.
- The practical work submission module and the thesis submission module are not yet one system.
  Therefore it is necessary to develop a system so that the application can run in one system so that it is easier for users.

For this reason, it is necessary to develop an information system that can be used for academic activities at the STT Wastukancana Purwakarta so that it can complement the existing deficiencies.

Business Modeling and Requirements

The software development process that begins with business modeling and requirements, from the results of a survey conducted by developers, can collect some of the information needed to carry out this software project. After that, the author can classify the application based on the needs that have been discussed.

The results include:

1. Added topic bid feature.
2. Renewal of the application process for practical work and thesis submission.

Running System Analysis

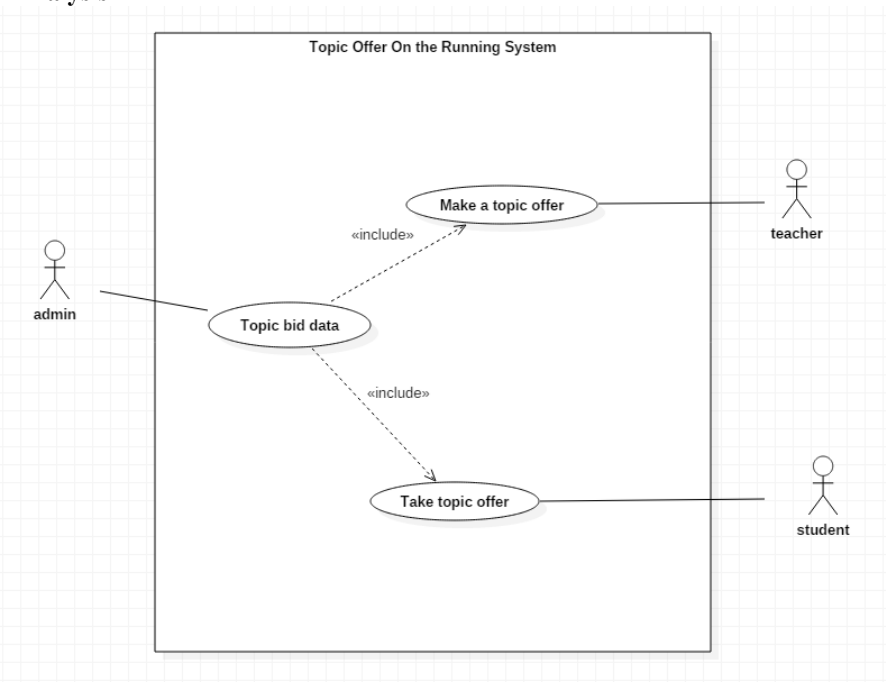

Figure 2 Use Case Diagram of Current Topic

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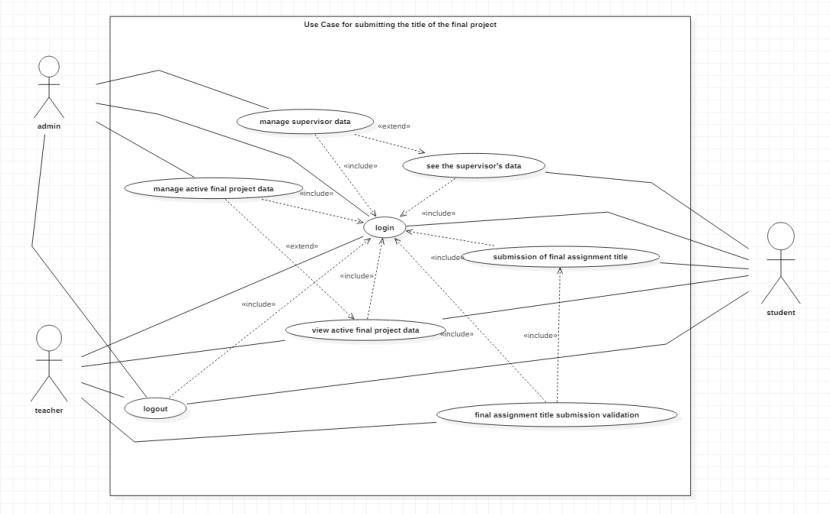

Figure 3 Use Case Diagram for Submission of Thesis

Elaboration
In this stage, the author finalizes the concepts that have been formed in the previous stage. Modeling is discussed in this process to provide a functional feature that will be implemented in a software project.

Business Modelling and Requirement
After passing the previous stage, the business modeling and requirements process re-occurs to improve the system requirements to be created, both in a flow and the features that will be implemented. And the modeling will be remade in the form of use case diagrams. At this stage, the author does not get additional needs.

Analysis System
Actor Definition
An explanation of what is done by the actors involved in the system being built. The following are the actors involved in the E-research information system.

Tabel 1 Actor Definition

No	Actor	Definition
1	Admin	Manage E-research information system
2	Students	Submit a thesis title and practical work
3	Lecturers	Validate thesis title submissions and practical work

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Use Case Diagram

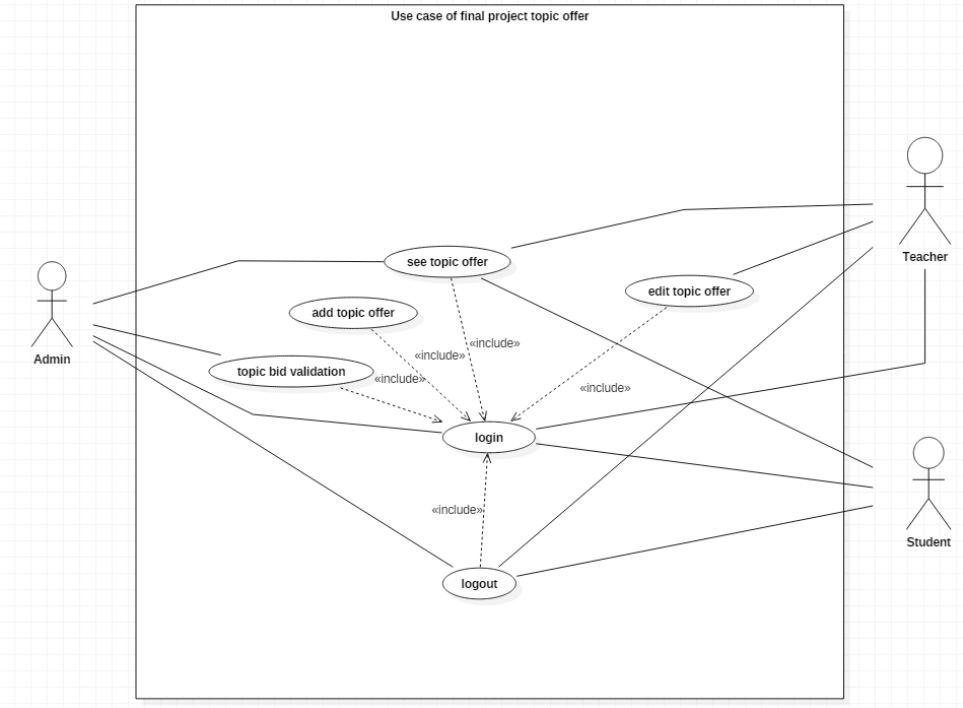

Figure 4 E-research information system thesis topic offer

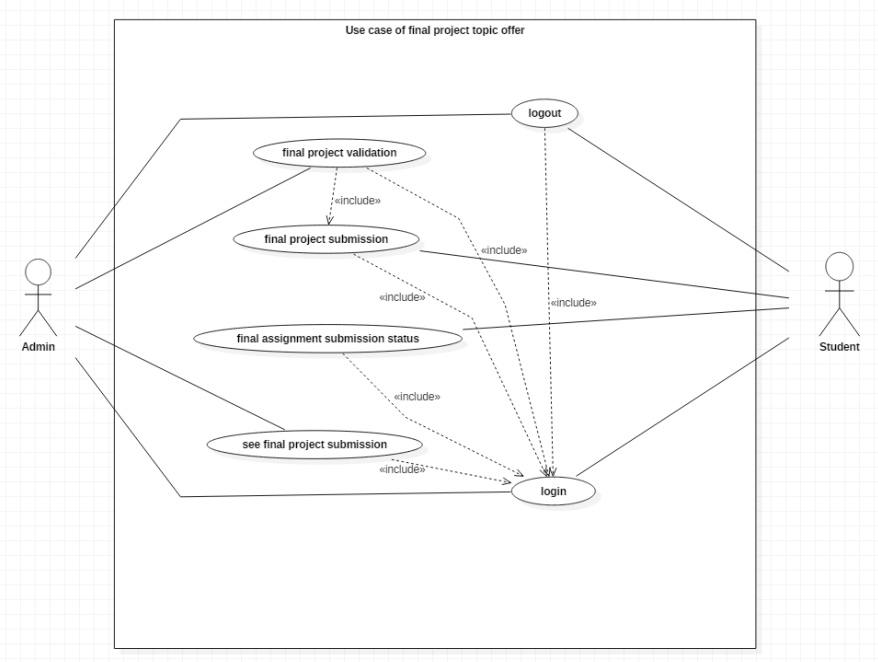

Figure 5 submission of thesis title for E-research information system

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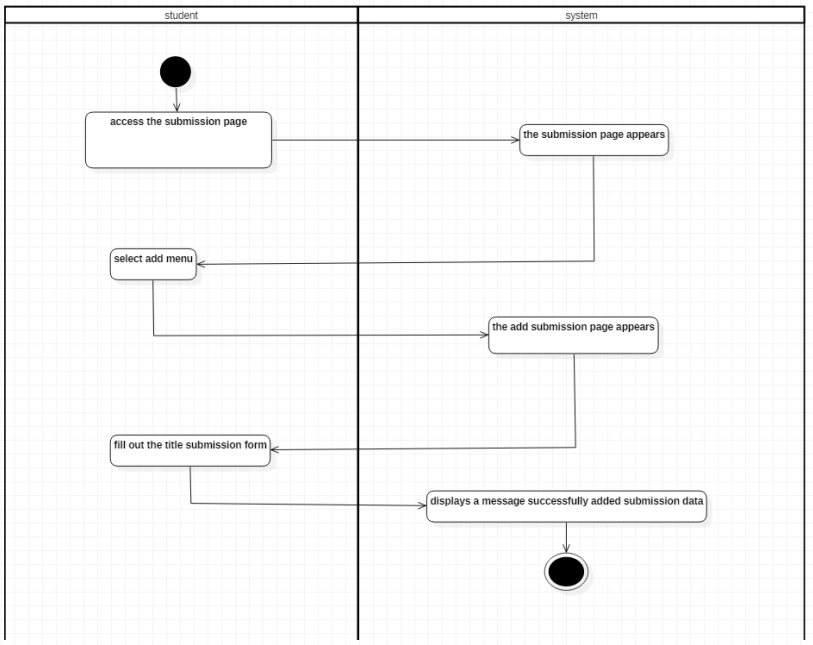

Figure 6 Activity Diagram for submission of thesis title

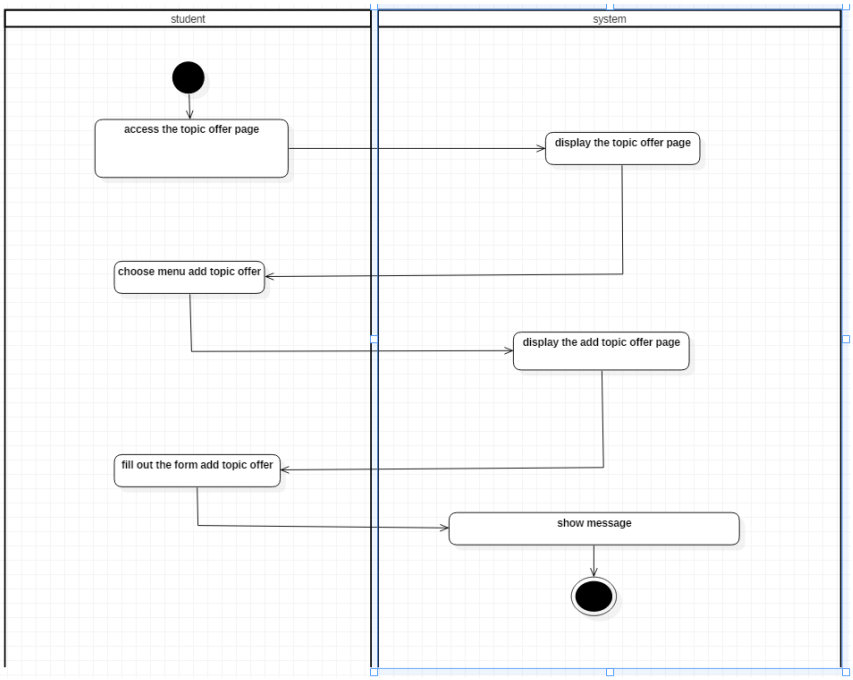

Figure 7 Activity Diagram add topic bid data

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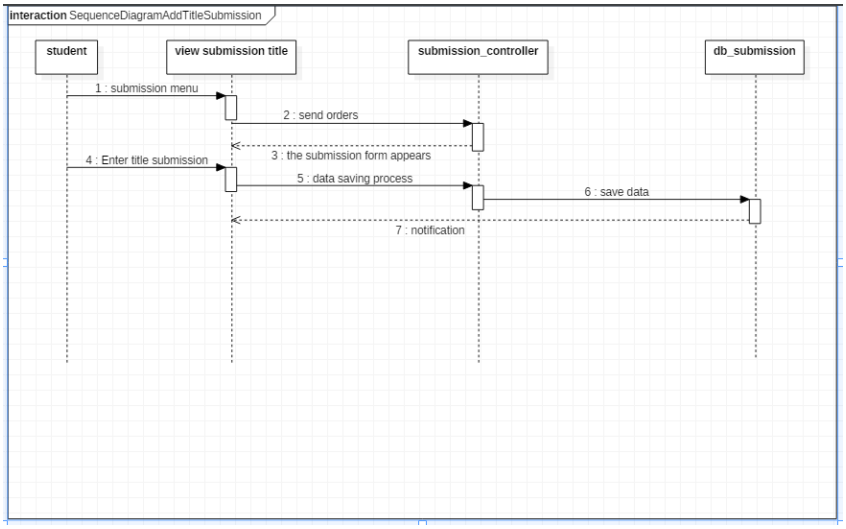

Figure 8 Sequence Diagram add thesis submission

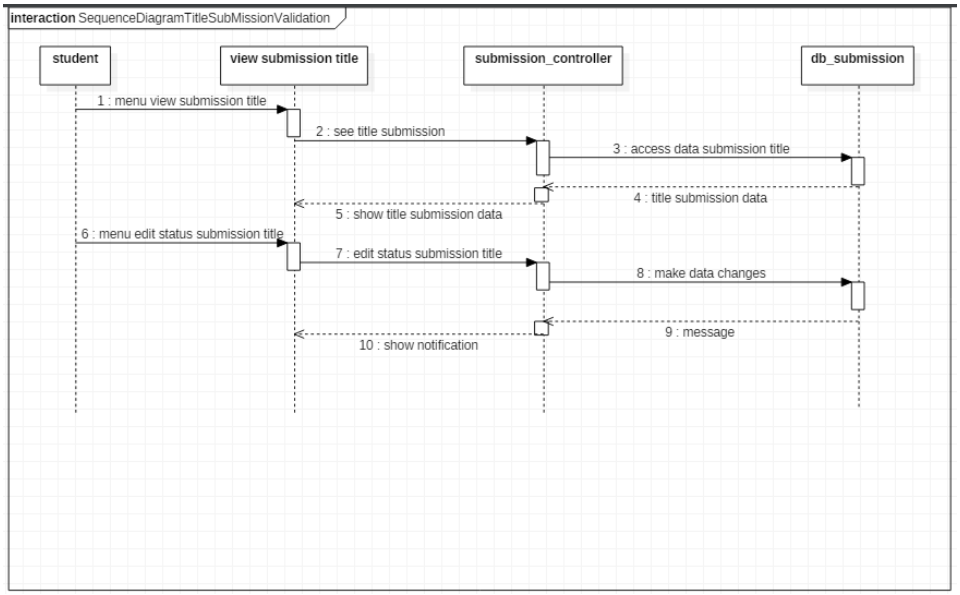

Figure 9 Sequence Diagram validation of thesis title submission

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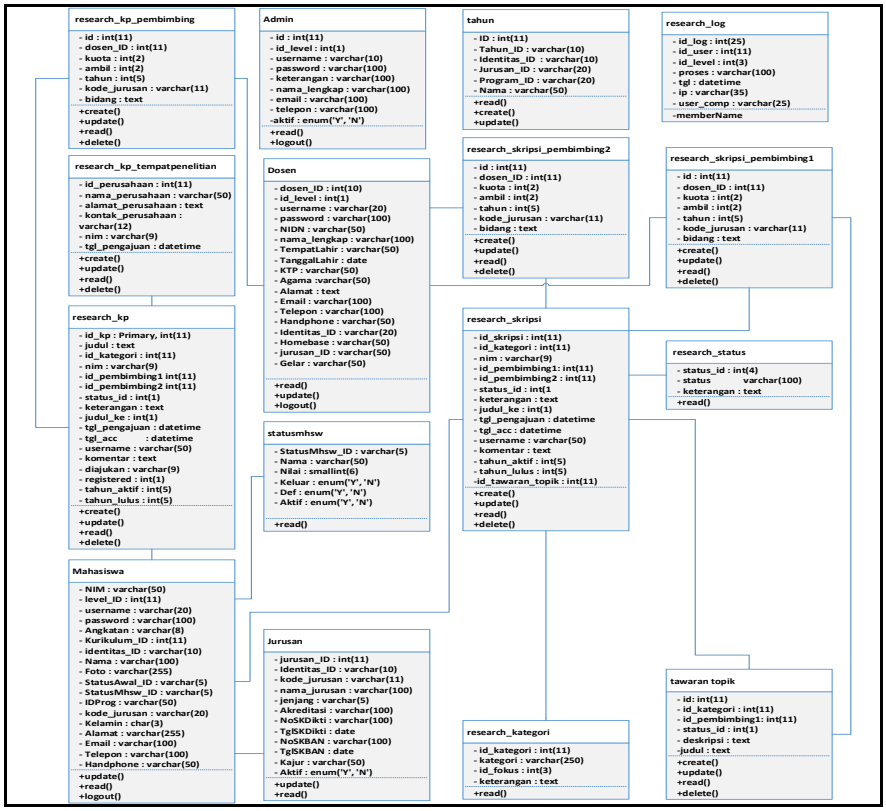

Figure 10 Class diagram of e-research information system

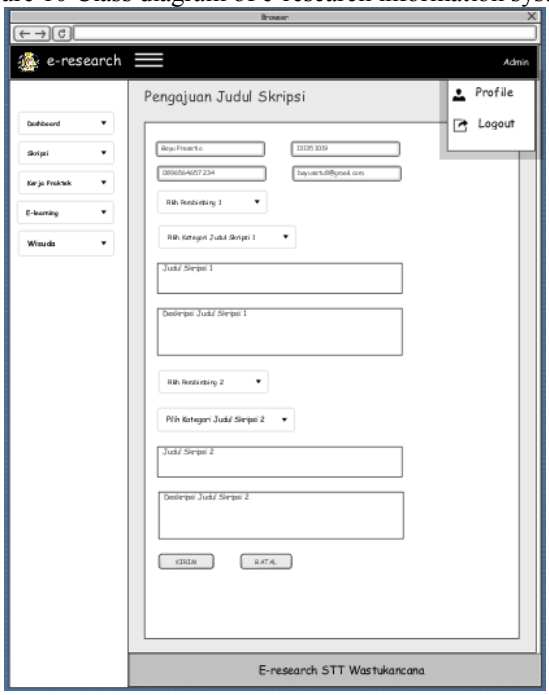

Figure 11 Thesis title submission page design

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DISCUSSIONS

Construction

At this stage, start to make a real system based on user needs that have been determined in the previous stage. The results obtained at this stage are in the form of an application that can be run.

Implementation

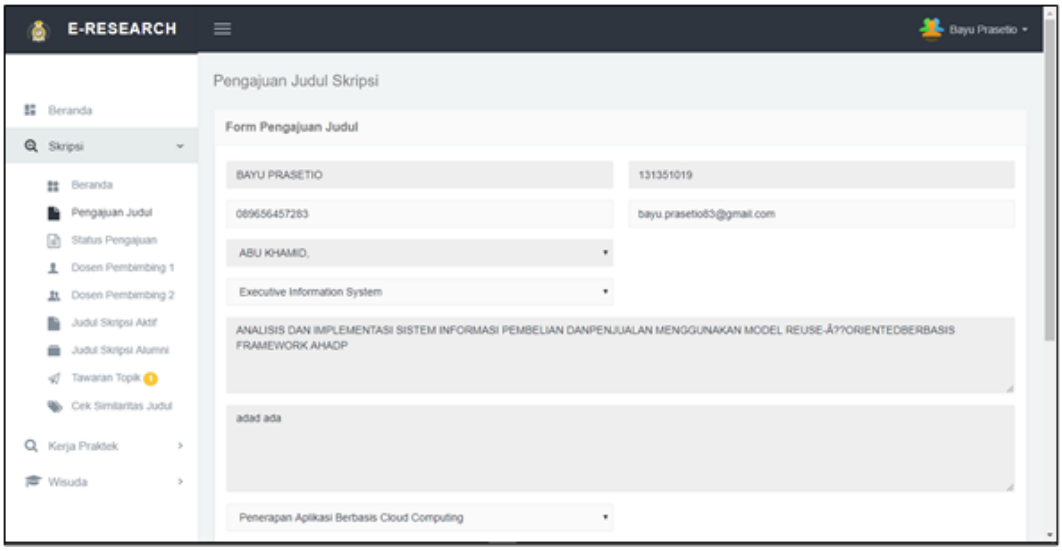

Figure 12 Thesis title submission page

CONCLUSION

The development of this e-research information system uses the USDP method as its software development method by going through the inception (data collection) phases, elaboration (modeling), construction (a system created using the PHP programming language), and transition (using the Blackbox testing method).

The features of this e-research information system include:

1. Data management of thesis supervisor
2. Data management for practical work supervisors
3. Topic bid data management

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