System Design of Tracer Study Development in Higher Education

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1. INTRODUCTION

The Ristekdikti regulation (now Kemdikbud-Dikti) states that the success of graduates in the world of work is one of the criteria for evaluating higher education accreditation. This is evidence that alumni are an important component that must be considered by all universities, because the progress of the campus/alma mater can be seen from the alumni [1]. Alumni can also be profitable marketers for universities, because universities that have quality alumni will certainly attract many prospective students who will look at their campuses [2].

Not only that, alumni can also be a way to get a network which is expected to create a good impression in the work environment, making it easier for younger classmates to be accepted in the same work environment [3]. Therefore, all campuses need institutions or career centers as a place for training and interaction facilities for alumni, and it is the...
obligation of universities to facilitate this. One of the facilities that must be provided by the Career Center is a Tracer Study [4].

Based on the research “Tacer Study Master Administration of Eduation of Uhamka“, The output of the tracer study survey includes the availability of important information regarding the relationship between tertiary institution and the world of professional work, assessing the relevance of higher education, information for stakeholders and completeness of requirements for university accreditation [5]. In addition to accreditation purposes, since 2011 Dikti has also used tracer studies as a monitoring tool for adaptation of university graduates in Indonesia when entering the workforce [6]. Tracer Study basically has its own format that has been designed by Dikti and can be downloaded at http://pkts.belmawa.kemdikbud.go.id.

Engr. Rolando P. Corpuz states by his research Tracer Study of Nueva Ejica University. When building the design, A study must include the employed graduates’ position in the agency [7]. The proposed approach in this research is how can the Tracer Study concept be implemented into a system design that can be developed.

2. RESEARCH METHOD

Research and Development according to Borg and Gall is “research and development is a powerful strategy for improving practice. It is a process used to develop and validate educational products” [8]. The basic method used in this study is Research and Development. In this study it called modified Borg and Gall Development method. This method is a research method used to produce design products [9]. The reason for using the word “modified” is because the development method used consists of only a few initial steps.

![Diagram](image)

**Figure 1.** Initial step Borg and Gall Development method

Based on figure 1, problems and potential problems that will exist can be searched for using the observation method through observing government regulations regarding tracer studies and the needs that must exist. The data collected in research planning for this study based on the degree of the source consists of two kinds of data, namely primary data and secondary data: (1) Primary data is data obtained directly from the first source of various kinds of official literacy published by Dikti regarding policies and tracer study formats; (2) Secondary data, namely data collected from institutions or agencies related to research [10].
The data analysis method used is descriptive qualitative data analysis method. The qualitative descriptive data analysis method in a qualitative research is useful for developing theories that have been built from data that has been obtained in the field [11]. At the initial stage of qualitative research, the researcher conducted an exploration, then carried out in-depth data collection, starting from observation to preparing reports in the form of a tracer study design design for the Career Center [12]. Product design is made based on the needs that have been found. The design of this system is built using additional software for drawing diagram

3. RESULTS AND DISCUSSION

3.1 Problem and Potential

Following up on the Circular of the Director General of Learning and Student Affairs Number: 471/B/SE/VII/2017 dated 26 July 2017 concerning the Implementation of Tracer Study in Higher Education, higher education institutions must implement tracer studies which are carried out through an integrated information system [13]. The existence of a Career Center in this case builds an information system that contains a Tracer Study with reference to the items contained in the Tracer Study System belonging to the Ministry of Education and Culture which can be accessed at http://tracerstudy.kemdikbud.go.id/.

As for the Website http://tracerstudy.kemdikbud.go.id/, it has been stated that mandatory and non-mandatory instruments must be applied in universities. The following (figure 2) is a display of the Kemdikbud Tracer Study page.

![Figure 2. Display of the Kemdikbud Tracer Study page](image-url)
3.2 Data Collection

Problems and potential problems that will exist can be searched for using the observation method through observing government regulations regarding tracer studies and the needs that must exist.

1. In system design there are 2 actors connected to the system. Namely administrators and alumni. Administrator has the function to validate and process data. Alumni have the function to fill out the tracer study page independently.
2. System design consists of Designing Data Flow Diagrams consisting of Context Diagrams and DFD Level 1.
3. System design should describe the flow and relationships between actors in the diagram.

3.3 Product Design

The study will design the first stage, namely the system design. The system design in this study consists of a level 0 DFD system design or called a Context Diagram and the second is a Level 1 DFD diagram [14].

3.3.1 Context Diagram

![Context Diagram](image)

*Figure 3. Context diagram*

The context diagram (figure 3) here describe about the system. The context diagram is used to establish the context and boundaries of the system to be modelled: which things are inside and outside of the system being modelled, and what is the relationship of the system with these external entities. A context diagram, sometimes called a level 0 data-flow diagram, is drawn in order to define and clarify the boundaries of the software system. It identifies the flows of information between the system and external entities. The entire software system is shown as a single process [15].

In this context diagram there are 2 actor, namely alumni and system administrator/Admin. Alumni communication with the system, namely the input of job data and the output of job information. Admin communication with the system, namely the input of alumni data and the output in the form of recapitulation of alumni work data.
3.2. DFD Level 1

Level 1 diagram is a breakdown of the context diagram:

![DFD Level 1 Diagram](image)

**Figure 4. DFD Level 1**

The Level 1 diagram in Figure 4 shows the communication flow from the actor to the process and to the database. It can be seen that this system consists of 4 processes, namely; (1) Alumni actors carry out processing of alumni data, namely the process of filling in biodata, personal data, educational history data and job search data where this data will be stored in the alumni database; (2) Alumni Actors carry out the Job Data Processing process which consists of filling out work history and current employment. This data will be stored in the Jobs database; (3) Alumni Actors carry out the Advanced Education Data Processing process which consists of filling out further education data if the alumni decide to continue their studies at a higher level. This data will be stored in the PT database; (4) The admin actor carries out the data recapitulation process which contains activities to recap all alumni data from personal data, work and further education. This process relates to alumni, employment and College databases.

4. CONCLUSION

The conclusion of this study is that the development of the Tracer Study system at a career center institution can be carried out according to the stages of software development which consists of several steps. The very first step in software development apart from requirements analysis is to design a system design. This system can run well if the system
design is designed according to system requirements and meets the needs of tracer studies in the real world.

Based on the modified borg and gall development, the design of this tracer study system consists of the design of the relationship between actors and the system in the form of level 0 diagrams and level 1 diagrams. This design can be made according to the institutional needs and regulations of DIKTI as policy makers in higher education.

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