System Design of Tracer Study Development in Higher Education

Alfonsa Maria Sofia Hapsari[1]*✉, Canakya Bima Ananda Putra[2]
[1,2] Infomation Technology Education, Universitas Slamet Riyadi
Corresponding Author: alfonsa@unisri.ac.id

Article Information	ABSTRACT
	Tracer study is pogram on the situation of alumni, especially in terms of job search, work situations, and the use of competency acquisition during college. Based on the benchmarks that have been set by Dikti, the development of tracer studies can be implemented in several stages, such as system design development, data design and interface design. With the development of the tracer study system design, it is hoped that it can become the basis for developing an integrated tracer study information system with the institution. The purpose of this discussion is to find a tracer study design that is in accordance with the rules and regulations to be applied in the institution. Using a modified Borg and Gall development model, the author focuses on product design development. The earliest design tracer studies discuss system design because this is the first stage in program design and it is the most fundamental. With this approach, designs can be developed and this is expected to be in accordance with the institutional needs and regulations of DIKTI as policy makers in higher education.

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 campusses [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 availibility of important information regarding the relationship between tertiary instituton and the world of professional work, assesing the relevance of higher education, informaton 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 bilding the design, A study must include the employeed graduates' position in the agency [7]. The poposed approach in this research is how can the Tracer Study concept be implemented into a system design that can be developed.

2. RESEARCH METHOD

Reseach 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 metdhod. 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.

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.
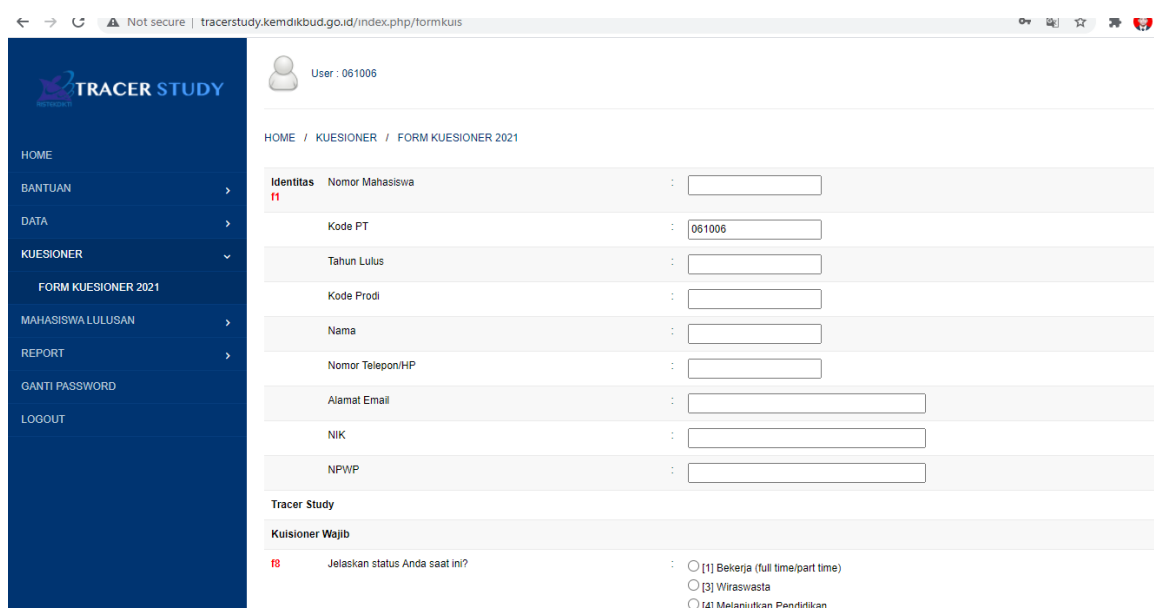

Figure 2. Display of the Kemdikbud Tracer Study page

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].

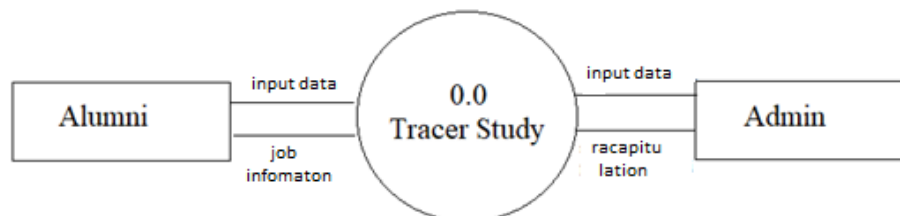### 3.3.1   Context Diagram

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:
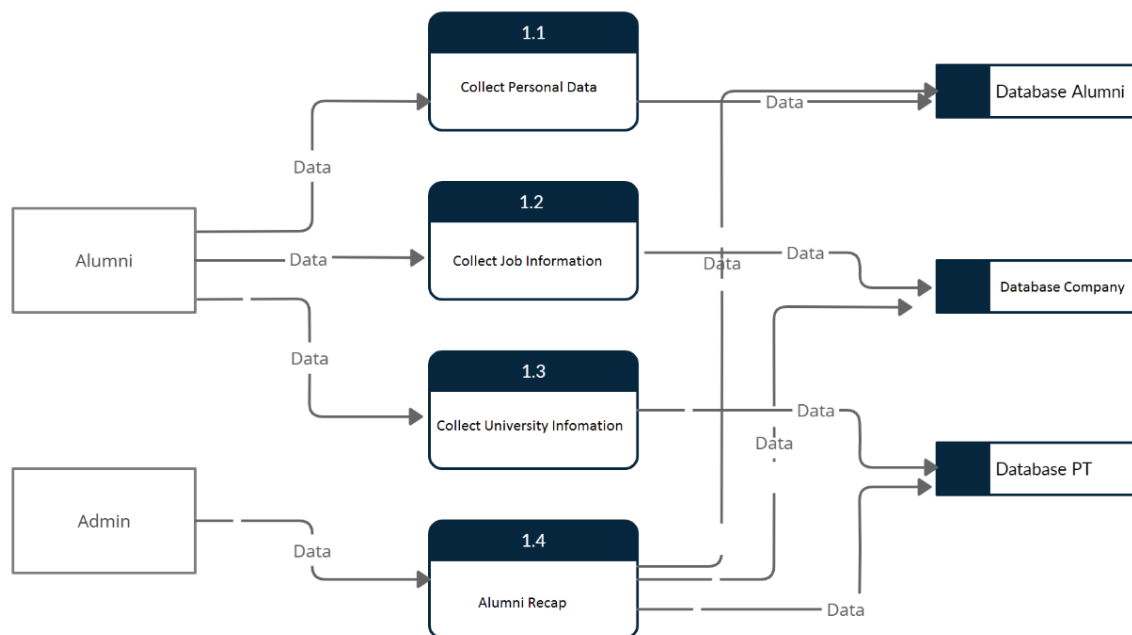

Figure 4. DFD Level 1

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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REFERENCES

[1] T. L. Ramirez, L. T. Cruz, and N. V Alcantara, "Tracer Study of Rtu Graduates: an Analysis," *Res. -Journal Arts*, vol. 66, no. 1, pp. 66–76, 2014.

[2] V. V. Pontillas, "Tracer Study on Bachelor of Science in Electrical Engineering Graduates of a Polytechnic College in the Philippines from 2007 to 2010," *Asia Pacific J. Multidiscip. Res.*, vol. 6, no. 2, pp. 36–46, 2018, [Online]. Available: http://www.apjmr.com/wp-content/uploads/2018/06/APJMR-2018.6.2.2.05.pdf

[3] A. C. Gines, "Tracer Study of PNU Graduates," *Am. Int. J. Contemp. Res.*, vol. 4, no. 3, pp. 81–98, 2014.

[4] M. Shongwe and D. N. Ocholla, "A Tracer Study of LIS Graduates At the University of Zululand," *Mousaion*, vol. 29, no. 2, pp. 227–245, 2011.

[5] J. K. Pendidikan, "Tracer Study Administration of Education of Uhamka As the Intention of the Educational Transformation Progress," pp. 452–464, 2020.

[6] E. R. P. Corpuz, "Tracer Study of Nueva Ecija University of Science and Technology Graduates (Atate Campus)," *Int. J. English Lit. Soc. Sci.*, vol. 5, no. 2, pp. 434–440, 2020, doi: 10.22161/ijels.52.17.

[7] A. B. Aquino, E. J. Punongbayan, L. P. Macalaguim, S. M. Bauyon, R. a Rodriguez, and G. R. Quizon, "Teacher Education Graduate Tracer Study from 2010 to 2014 in One State University in Batangas, Philippines," *Part II Asia Pacific J. Multidiscip. Res.*, vol. 3, no. 5, pp. 45–50, 2015, [Online]. Available: https://www.apjmr.com/wp-content/uploads/2016/01/APJMR-2015-3.5.2.06.pdf

[8] H. Schomburg, *Carrying Out tracer studies: Guide to anticipating and matching skills and job*, vol. 6. 2016. doi: 10.2816/753132.

[9] W. R. B. M. D. Gall, *Educational Research*, 5th ed. New ork: Longman, 1983. [Online]. Available: https://www.worldcat.org/title/educational-research-an-introduction/oclc/557863038

[10] G. Tefera, "A Tracer Study on (2011 – 2013) Debre Berhan University Graduates Integration in to the World of Work," *Int. J. Second. Educ.*, vol. 6, no. 2, p. 37, 2018, doi: 10.11648/j.ijsedu.20180602.13.

[11] L. J. Cuadra, M. R. K. Aure, and G. L. Gonzaga, "The Use of Tracer Study in Improving Undergraduate Programs in the University," *Asia Pacific High. Educ. Res. J.*, vol. 6, no. 1, pp. 13–25, 2019, [Online]. Available: https://www.academia.edu/40583968/The_Use_of_Tracer_Study_in_Improving_Undergraduate_Programs_in_the_University?auto=download

[12] K. Bariyyah, "Unikama Tracer Study : An Effort To Get Graduates ` Feedback Towards Superior Universitiy," pp. 17–18, 2019.

[13] N. Fajaryati, S. Pambudi, P. Priyanto, T. Sukardiyono, A. D. W. Utami, and B. Destiana, "Studi Penelusuran (Tracer Study) Terhadap Alumni Program Studi Pendidikan Teknik Informatika Jurusan Pendidikan Teknik Elektronika Fakultas Teknik Universitas Negeri Yogyakarta," *Elinvo (Electronics, Informatics, Vocat. Educ.*, vol. 1, no. 1, pp. 44–45, 2015, doi: 10.21831/elinvo.v1i1.10878.

[14] J. Russell and B. Russell, "A systems analysis and design case study for a business modeling learning experience for a capstone CIS/IS systems development class," *2014 Proc. Inf. Syst. Educ. Conf. ISECON 2014*, vol. 13, no. November, pp. 77–96, 2014.

[15] R. Ibrahim and S. Y. Yen, "Formalization of the Data Flow Diagram Rules for Consistency Check," *Int. J. Softw. Eng. Appl.*, vol. 1, no. 4, pp. 95–111, 2010, doi: 10.5121/ijsea.2010.1406.

[16] W. Wulandari and A. D. Y. Widiantoro, "Design Data Flow Diagram for Supporting the User Experience in Applications," *Int. J. Comput. Internet Manag.*, vol. 25, no. 2, pp. 14–20, 2017.