ONLINE TRACER STUDY OF BUNG HATTA UNIVERSITY

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ABSTRACT: This research serves as the basis to design an online graduate tracking system needed by Bung Hatta University to meet the standards required by National Accreditation Board of Higher Education Institutions of Indonesia (BAN-PT) and the University stakeholders. The system, which is called Tracer Study, is programmed by using PHP and MySQL programming languages and by applying CMS Bootstrap. There are four actors/elements involving in the Tracer Study, namely: Graduates/Alumni, Employers of the Graduates, University Official, and Administrator of the System. The system applies waterfall method with several stages of processing, namely analysis, designing, coding, testing, and maintenance. The design of Tracer Study has already been tested at small scale within the circle of the Faculty of Teacher Training and Education and is currently applied at big scale by uploading the same at the website of Bung Hatta University after obtaining the approval of University official.

Keywords: Tracer Study , PHP- Mysql, Bootstrap, Waterfall method

1. INTRODUCTION

In line with the policy of the Directorate of Higher-Learning Education of Indonesia (DIKTI) which requires all universities in Indonesia to be capable of preparing their graduates who are ready to compete in competitive job market amid imbalanced supply and demand in employment opportunity, and in order to improve the quality of human resources produced by the universities, it is necessary to collect thorough information regarding the graduates and their achievement, particularly during transition period from the time they leave the university until they find a job, including the performance of such graduates in performing their job. To collect such information it is necessary to perform a study called *Tracer Study*. "Reference[1] describes the Tracer Study as follows: Tracer studies take a retrospective look at the evolution of the situation of a sample of children/students already provided with or exposed to a specific intervention. It is an enquiry approach at a single point in time that generates data on already achieved impact"

The quotation above underlines that tracer study is a method to track information on a certain sample by firstly making certain intervention in such a way that it shall eventually produce a desired effect. Then [4] conducted a study to the students of FEB-UKSW and found that the graduates of the university were absorbed by job market within a transition period of 3 months after their graduation and most of them get the jobs which are in accordance with their field of study. For conducting the study, [4] applied descriptive quantitative research method.   A similar study was conducted by [5] to the alumni of State Polytechnic of Padang.

The study gave a picture of the alumni profile in terms of time period needed by alumni to get a job, standard GPA desired by employers, and optimization of the learning process required to maximize the skills and knowledge of the students.

Different from the abovementioned researches, in this research we will design a system for an online tracer study that can be accessed directly by the university's officials for them to see the picture of performance of the graduates, and to receive opinions and suggestions from the graduates and their employers. All of such information have been directly processed by the system and commensurate with the items needed for accreditation process

National Accreditation Board of Higher Education Institutions (BAN-PT) defines graduate as a status having been achieved by a student after completing his/her education process in accordance with the requirements set out by his/her study program in a university. One of the direct output of the educational process in the study program is to produce qualified graduates which should possess a characteristic of mastering academic competencies, namely *hard skills* and *soft skills* as stated in the quality objectives of the university, and as proven by the performance of the graduates in the community in accordance with their profession and education background. A quality university should have a good management system for its graduates so that the graduates can be used as human capital for their university. One of the universities which has applied good graduate management system is Bandung Institute of Technology (ITB) with its ITB Career Center, and has produced tracer study report since the year of 2007.

Bung Hatta University as one of the private universities in Indonesia consists of 7 faculties and 1 post-graduate program with 31 study programs, and has produced more than 36,000 graduates. The university has actually applied something like an alumni tracking program since 2005, namely in the form of questionnaires distributed to the alumni. By using WEB-based database, the university then produced database of alumni per faculty, named SIALU (Bung Hatta University Alumni System). But the instruments being used and information received are not sufficient for the management to make decision for future development. There are some additional indicators which must be provided any further in a bid to meet the standard set out by Higher Learning Education Directorate and National Accreditation Board of Higher Education Institutions (BAN-PT) of Indonesia.

This research aims at designing an online system for tracking the graduates of Bung Hatta University. A system, according to [6] is a working network of interconnected procedures, gathered together to perform an activity or to accomplish a particular goal. It is very much necessary in a company or government institution for supporting their performance, no matter how small or large they are. In order for the system to run properly, a harmonious cooperation between the elements in the system is a must.

To design an online system we use a web-based information system to facilitate a communication between two or more computers. The web-based information system consists of a web on server side and a web on client side. The web on client side is a web that is used by the client to access services provided by the information system. The web on the server side is a web being provided for presenting the services that can be accessed by the server in an information system which has designed and prepared previously. In 2012, the Directorate General of Higher Education Institutions through the Directorate of Learning Activities and Students Affairs initiated an online tracer study system in its website: *evaluasi.dikti. go.id/tracerstudy* designed as a career development center, but the system until now fails to work properly. As in [3] has also made an application program which can be used for organizing and processing survey related data named QTAFI. The first institution which introduced this program is Incher-Kassel, Germany. However, for accessing the program there are certain requirements to be fulfilled.

In general, a web-based information system has the following functions:

1. Communication Function

In a web-based information system there are communication facilities such as chatting, forums, contact forms, web mail, etc.

2. Information Function

Web-based information system plays significant role in providing information. With no limitations on distance, space, and time.

3. Transaction Function

Web-based information system can also be used as a means of business transactions, either for goods, services and others.

There are several information to be developed in a tracer study system which afterward can be used by university official to assess the performance of the alumni, to evaluate the education program and to fill in the accreditation forms. The system consists of the following contents:

a. Overview of the career of the graduates, covering the profile, length of time until finding the first job, job position, suitability of the education background with the current job, and input for curriculum development.

b. Opinion of the alumni regarding their competence when compared to the requirements of BAN-PT and the demands of the real world in employment.

c. Opinion of the employers regarding the capability; integrity (ethics and morals), knowledge-based expertise (professionalism), English proficiency, proficiency in information technology, communication, teamwork, and self-development.

When the alumni tracking system has been set online in the university's website, all graduates and their employers will easily participated in giving information and suggestion, and fill in the data asked by the university at any time, and all of the data may be used by the university official to evaluate its programs and to fulfill the requirements for improving the accreditation of Bung Hatta University.

2. RESEARCH METHOD

Because this research is directed for developing the tracer study system, the research method being used shall be research and development (R&D) method. According to [7] research and development method is a method being used to produce certain product and at the same time to test the effectiveness of the product. Procedure of this research can be seen in the following Fig 1.
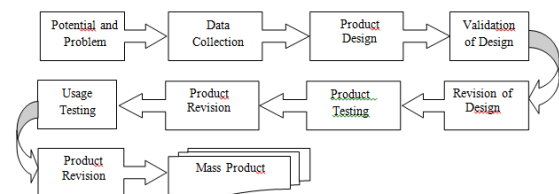

Fig. 1. Procedure of Research and Development(R&D) Method

In view of Fig 1 above, the steps to develop online tracer study of Bung Hatta University shall be as follows:

a. Analyzing the potential and problems associated with the development of the system.

   This step is done by performing library research in order to find literatures and journals related thereto, and scientific evidences from researchers who have ever made similar research before. The fact that Bung Hatta University has yet to run online tracer study system even though it has already had web-based information system is the potential for performing this research.

b. Collecting all necessary data by conducting field studies regarding the system and the implementation of tracer study in some universities which have already implemented the tracer study, such as Bandung Institute of Technology (ITB) and Gadjah Mada University (UGM).

c. Designing the system and applying the tracer study based on information obtained in the previous two steps, in the following forms:

   1) Design for Input

      Design in the form of tables is used to give clear picture and written description on the data existing in database. The sign * represents *index*.

      a) Administrator Table

      Table Name   : tb_admin
      Used for   : Logging-in by administrator to the system
      Key Field   : Password

Table 1. Administrator Table

Field Name	Key	Type	Field Width	Remark
Id Admin	*	Varchar	20	Primary Key
Password		Varchar	100	
Name		Varchar	50	
Title		Varchar	100	

   b) Questioner Table

      Table Name   : tb_kuisioner
      Used for   : inputting questioners
      Key Field   : Questioner Number

Table 2: Questioner Table

Field Name	Key	Type	Field Width	Remark
Questioner No.	*	Integer	20	Primary Key
Title		Varchar	100	
Question No		Integer	50	Auto Increment
Question		Varchar	250	

   c) Report Table

      Table Name: tb_laporan
      Used for :   inputting reports
      Key Field   : Report Number

Table 3: Report Table

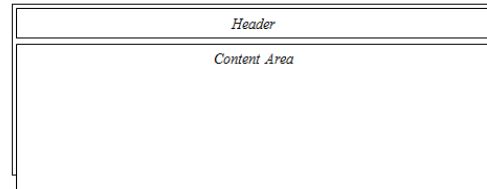| Field Name	Key	Type	Field Width	Remark
Report No.	*	Integer	20	Primary Key
Report Title		Varchar	100	
Report Contents		Varchar	50	

   2) Design for Output

Fig 2. Design for Main Page

Header is part of the appearance at each page containing the title of the website and navigation of for exploring the website. *Content Area* is the column for presenting the contents of the website, whereas *footer* is part of the page for presenting the identity of the website as well as serving as *shortcut* to existing menus.

d. Validating the system for evaluating whether the system which has been developed rationally would be more effective than the existing systems. This is done by asking for the opinion of multimedia experts and in view of the need of university's management. The multimedia experts are of the opinion that the appearance of the online tracer study system is rather less interesting, but the features have accommodated all the needs.

e. Fixing the system based on the description on system weakness as obtained in step d, namely by improving the system. After the appearance is fixed then the online tracer study system is eligible to be tested.

f. Limited testing of the system by involving certain study programs and faculties within the circle of Bung Hatta University. In this case the system is tested to the Faculty of Teacher Training and Education of Bung Hatta University.

g. Revising the system based on the input and feedback obtained during limited testing. Improvement of the system is mainly focused on the matters that interfere and impede the smooth implementation of the system.

h. Testing of the system in a broader scope, involving the alumni of 2009-2014. The result of testing shows that in average, the alumni work as teachers either in private or public school. There are some who work in private company and government institution in Indonesia.

i. Revising the system based on the weaknesses and defect found during testing in actual conditions in step h.

j. Disseminating the system through seminars by inviting the parties having competencies and interest with the implementation of the system.

Institutionally, Tracer Study development process shall be under the supervision of the Second Vice-Rector for students and alumni affairs. In the development process, Trace Study shall involve any other relevant parties, including the core team which is appointed by the university's management to form technical implementation team and preparing the action plan. The core team is assigned to run the tracer studies conceptually and operationally.

In general there are 3 (three) teams directly involved in Tracer Study, namely; (1) Tracer Study Development Team which consists of researchers of the system, in cooperation with the related unit in the students management department of Bung Hatta University. This team has the duties of planning, implementing, report handling and disseminating the results of tracer study; (2) Technical Implementation Team, which is assigned to send the PIN of data to the alumni, checking it periodically and making contact by telephone to remind the alumni to fill in the instrument; (3) IT Systems Development Team, which is under the coordination of the Head of Electronic Data Center (PDE-Pustikom) and assigned to develop alumni web by applying the web tracer, to post online questionnaire in the web, and to maintain and provide database.

Specifically, implementation of the tracer study is intended to find empirical evidence of the graduates of Bung Hatta University regarding 8 (eight) objects of study as follows.

a. Socio-biographical characteristics, education, and occupational background of the alumni before going to the university;
b. Educational activities and learning experiences during the study in the campus;
c. Job searching and transition to the world of work;
d. Current occupation;
e. Relationship between competencies acquired during the study with the demands of the world of work;
f. Expectations of the alumni to the University;
g. Satisfaction level of the employers of the alumni;
h. Work value orientation.

There are several stages of research activities to be carried out, namely (1) preparing the instruments which elaborate the demands of various related units, both internal and external, such as complying with the standard set out by Higher Education Directorate, observing the university benchmarking, as well as formulating the items representing the characteristic of Bung Hatta University as educational institution. (2) Converting the questionnaire into digital data and posting it online by using the programming language PHP and MySQL through CMS Bootstrap. (3) Preparing the

hosting and domain for placing the validated online web questionares, (4) Preparating and distributing password / PIN to alumni via email. The data used for the PIN shall be drawn from the update preliminary data of the graduates. (5) Sending the email data to all alumni, (6) Processing and analyzing the data obtained from questionnaire, and (7) Socialization and dissemination of the study in the form of seminars, journals and others. The stages can be seen in the following Fig 3.
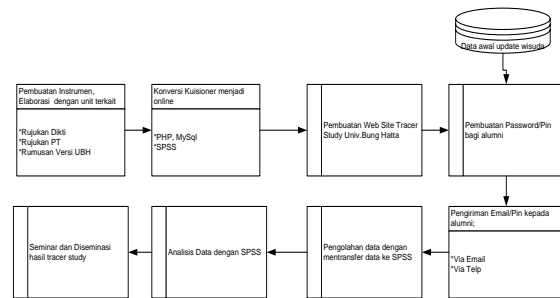

Fig 3. Flowchart of Tracer Study

3. RESULTS AND DISCUSSION

In reference to R&D procedures as set out by [7], the results of designing of the tracer study program is presented under the following menu:

3.1. Main Page

The main page of Bung Hatta University Tracer Study is the page called Home. When this website is accessed for the first time, the Home page will show-up. This page contains a slideshow welcoming the user into the Tracer Study of Bung Hatta University and under the text there is a button that directly leads to the tracer page. At the top of the display there is a logo on the left and navigations consisting of "home", "tracer", and "about" on the right part. The main page can be seen in Fig 4.
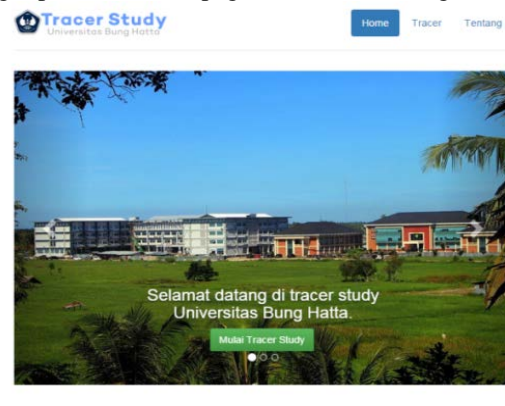

Fig 4. Main Page

3.2. Tracer page

Tracer page is the page for the users to select the login type. There are three types of users in Bung Hatta University Tracer Study, namely as

alumni, **employer**, and **university official**. In such page there are short description below the picture, types of users, and the login button for each user (Fig 5).
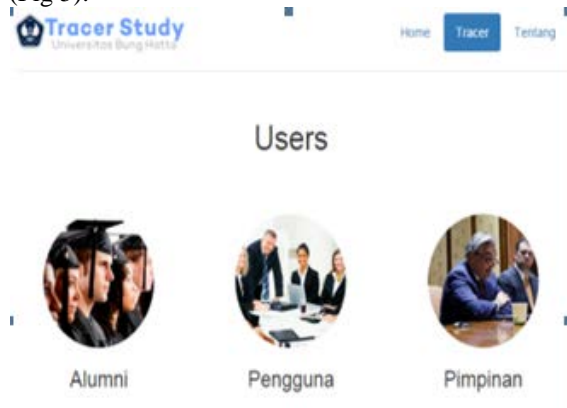

Fig 5. Tracer Page

When the user wants to enter the website as a graduate of Bung Hatta University, he/she may click the alumni login button. The Alumni login page will then appear that contains the *login form* for the alumni. This page contains *username* box using NPM as the username and password text box for entering the alumni page. The alumni login form can be seen in Fig 6 and alumni profiles form in fig 7.

Fig 6. Alumni *Login Form*

Fig 7. Alumni *Profile Form*

Upon entering the alumni page, for the alumni who has not yet filled in the data, he/she will be directed to the alumni profile form containing NPM box with name, gender, address, telephone / mobile phone number, email, department, class, graduation year, and occupation. The questionnaire form will appear immediately after the alumni loging-in by filling in his/her data. The questionnaire form consists of the questions with answers range of 1 to 5. For data input in HTML the *radio button* input type is used. By using the radio button the alumni may only choose one answer for each point. Display of Alumni Questionnaire Form can be seen in Fig 8.

Fig 8. Alumni *Questionnaire Form*

After answering all the alumni questionnaire and click the save button, the page will move to a page containing the expression: "Thank you for filling in the questionnaire tracer study of Bung Hatta University". This indicates that all data has been filled.

In the tracer page there is also a tool for the employer of the alumni. By clicking employer login button, the user chooses to enter the system as the employer of the alumni of Bung Hatta University. Employer login form consists of the boxes containing number and password of the employer as in Fig 9.

Fig 9. Employer *Login Form*

The employer profile form as in Figure 9 will appear after the employer successfully log in. Similarly with the alumni profile form, the employer profile form will appear when the employer has not yet filled in the personal data. In the employer

profile form, the contents consist of employer number, name, job title, name of institution/company, address of institution, phone / fax number, and email.

Fig 10. Employer Profile Form

Once the employer fill in the data or if he/she has filled in the data before, then the employer questionnaire form will appear as shown in Fig 11.

Fig 11. Employer Questionnaire Form

The employer questionnaire form also contains questions with answers range from 1 to 5 and also uses radio button input type. After answering the questionnaire, the new page will appear with the expression "Thank you for filling in the questionnaire tracer study of Bung Hatta University". This page also indicates that all data has been filled.

Tracer study page also provides a tool for Bung Hatta University officials. On the tracer page, when the official clicks the login button named official it means that he/she enters the system as the high ranking official or person in charge of validating the data in the Tracer Study of Bung Hatta

University. To be eligible for signing in to the official account one must firstly pass through the login page for official (Fig 12).

Fig 12. Login Form for Official

Similar to alumni and employer page, the login form for official also consists of username and password. After completing the login, the official will see the main page that contains the dropdown button to display the menu. The menu consists of alumni questionnaire, employer questionnaires, tracer reports and validation (Fig 13).

Fig 13. Menu in the Main Page for Official

The page containing the answers from the alumni to the questionnaire shall show up when the official clicks on the alumni questionnaire button menu. This page will display the table of answers from the alumni and the field thereof which consists of number, questions, and answers of five answer options table (Fig 14)
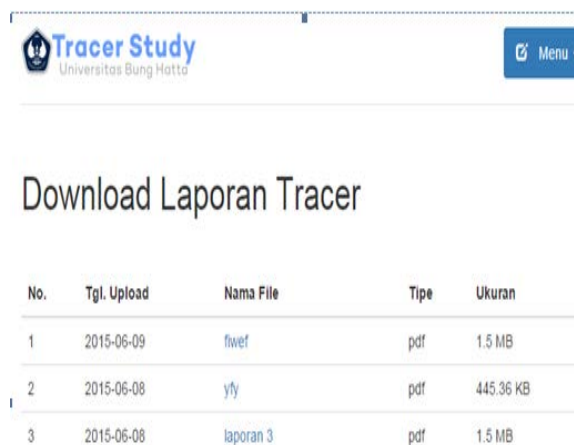

Fig 14. Page of Alumni Answer to the Questionnaire

The page of employer's answers to the questionnaire shall also comes up when the official selects employers questionnaire menu. This page is similar to the page of alumni's answer to the

questionnaire, but the data being used are those of the answers of the employers.

Furthermore, the page of tracer report download is a page that displays the tracer study reports which have been uploaded by the administrator for the purpose of validation by the official. The official may open the report by clicking tracer report menu. In this page, the official may download the report by clicking the name of the report file (fig 15).

Fig 15. Page of tracer study report download

Validation page appears after the official selects the validation menu. On this page the official may validate the reports that have been entered by the administrator. This page consists of two parts, namely the part for making validation and the part containing the table of validation report of tracer study. In the part for making validation, the validation can be done by selecting the file name and then click the save button.

The most important page is the administrator page, which is the page that can only be used by the administrator to manage the entire data of Tracer Study. Admin login page contains admin form for entering into the admin page. The form consists of number of the admin as the username, and password. To add a new alumni account, the admin can add it in the alumni account page. Admin shall only need to enter the ID and new password on the panel of additional alumni account and click the save button. Furthermore, to add user accounts, the admin can choose the menu of user account page. The procedure is much the same with that of the alumni account. On this page there is a panel consisting of the box for filling in the ID and password. The admin shall only need to enter the ID and password and then click the save button to add a new user account. As shown in Fig 16.

Similar with alumni account page and employer account page, the official account page is used for adding new account by entering a new ID and password on the panel of add official account. The Admin may choose additional pages for giving question to the alumni on the sidebar.
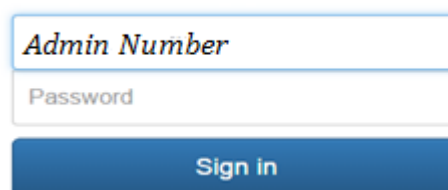

Fig. 16. Administrator Login Form

The Admin shall enter the number and write down the question and click the save button. The questions that have been added shall be displayed in the table under the panel of adding question to the alumni. Similarly, to add to the question in the questionnaire to the employer, the admin can choose the page of adding question to employer. The administrator shall enter the number and the question and click the save button. The questions that have been added will be displayed in the table under the panel of adding question to the employer. After the admin completely processes the data in the page of employer's answers and the page of alumni's answer and save them in pdf format, the admin can upload the report so as to be seen by the official for validation purposes. To upload a report, the admin can select the page of report upload. On this page the admin shall write down the name of the report and take the reports from the admin computer by using choose file button and thereafter he/she shall save it by clicking the upload button.

4. CONCLUSSION

Having completed this study, it can be concluded as follows:
1. The Tracer Study of Bung Hatta University is useful for collecting alumni data and for understanding the level of satisfaction of the employers of the alumni. These data shall be beneficial for continuous development and improvement of Bung Hatta University.
2. The information presented in the web-based Tracer Study of Bung Hatta University shall take the form of matrix or table. It is also equipped with the feature to upload and download the tracer study reports on the admin page and the employer page.
3. There are four actors playing roles in this system, namely alumni, employers of the alumni, university officials, and administrator. This program is designed by using the PHP and MySQL programming languages and by applying bootstrap as CMS tool.

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