Information System Design Activities Of Kuliah Kerja Nyata Using Single Linkage Method

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ABSTRACT

The registration system of Kuliah Kerja Nyata (KKN) conducted at UPN "Veteran" East Java, is still manual, and takes time to queue at the KKN payment counter. This in the wake of the system of community service information that includes this KKN in order to facilitate students in the process and for the university can more easily in the formation of groups automatically.Peranan Group automatic grouping is very important for model random design group on later KKN. In this study the authors use the Single Linkage method. Single Linkage Method is a clustering hierarchical grouping method. Single Linkage method of grouping the data at the closest distance between groups, on some variables that exist in the Single Linkage is from the needs of LPPM UPN Veteran East Java, so officers in LPPM UPN Veteran East Java is no longer difficult in doing the division of students in each group of KKN.

Keywords: Information System, Kuliah Kerja Nyata, Single Linkage.

1. Introduction

Pengabdian Masyarakat is an integral part of tri dharma of higher education which in its implementation can not be separated from two other dharma as well as involving all academic community: lecturer, student, education staff and alumni. Duties at UPN "Veteran" of East Java are not only conducting education for their students, but also conducting research and developing innovation, as well as the preservation and development of superior science and benefit to society.

LPPM (Lembaga Penelitian dan Pengabdian Kepada Masyarakat is one of the implementing units within the Directorate of Direktorat Pengabdian Masyarakat who is in charge of managing and coordinating the activities of Kuliah Kerja Nyata – Pembelajaran Pemberdayaan Masyarakat (KKN).KKN (Kuliah Kerja Nyata) is a university compulsory subject that aims to produce students who have the ability to analyze problems and potentials in society, have empathy and concern for all forms of problems in society, and capable of applying science and technology in teamwork and interdisciplinary, instilling values of personality (nationalism and soul of Pancasila , resilient work ethic, responsibility, self-reliance, leadership spirit, entrepreneurial spirit and soul of researcher).

Based on the background that has been described above, it can be formulated issues such as how to create information systems that can manage community service activities that include the field of Real Work Lecture and how to form a group Student Real Work Lecture is done using Single Linkage method, while for the purpose from this research is with web responsive for registration of KKN online is one way to minimize paper usage.

Literature Review

Information systems are a combination of working procedures, information, people and information technology organized to achieve goals within an organization, Gelinas, Oram and Wiggnis (1990) an information system is a man-made system that generally consists of a set of computer-based and manual components created to collect, store and manage data and provide output information to users. The information system is a set of formal procedures in which data are grouped, processed into information and distributed to the user. (Hall, 2001).

The research ever undertaken in relation to cluster analysis with the single linkage method is one of the following Miftakhul Huda (2016) in his study entitled

"Pengelompokkan Kecamatan Berdasarkan Pertumbuhan ekonomi Menggunakan metode Single Linkage di Kabupaten Bantul." This study aims to determine the grouping of sub-districts by sector using the single linkage method and to know the characteristics of each cluster that is formed.

2. Research Method

With this systematic research process can be understood and followed by other parties. Research conducted to design the system obtained from the observation of existing data. Application requirement analysis is done to find out user requirement to developed application. This needs to be done so that applications are developed according to the needs of users. This section also explained who will use this application, and what information is used by researchers.

System Development Life Cycle (SDLC)

Development method used by writer in this research that is use SDLC *(System Development Life Cycle) model*development or engineering of information systems (*software enginering*). SDLC diagram this can be seen in figure 1 bellow

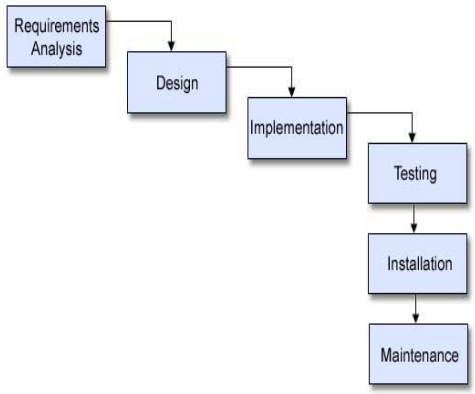

Figure 1. SDLC's Development Chart

1. Requeirments Analysis

   At this stage we try to recognize any problems that arise to the user by decomposing and realizing use case diagram further, regarding the components of the system or software, objects, relationships between objects and so forth.

2. Design

   In the design stage where the author tries to find a solution of the problems obtained from the analysis phase. At this stage the design includes the database design and interface design of the system or application to be created.

3. Implementation

   At this stage of manufacture is a process of making the system according to the needs that have been analyzed previously in accordance with the database design and interface design that has been made in the previous session. To be understood by the machine, in this case is the computer, then the design had to be changed its shape into a form that can be understood by the machine, that is into the programming language through the process of coding.

4. Testing

   Something made trial. Likewise with software. All software functions must be tested, so that the software is free from errors, and the results should be perfectly in accordance with the needs that have been defined previously.

5. Installation

   In the installation process is done when the trial process has been declared completed and no more bugs so that applications or systems ready for mass use in certain circles.

6. Maintenance

   At this stage the maintenance process is needed, because the system or application that has been running certainly requires a maintenance process, because data that has been entered into the system will increase.

3. Discussion

3.1. Design Information System

a. Flowchart

   System design in the form of flowchart or flowchart that will explain the flow starting from the start with the symbol of the circle and then forwarded with a symbol of the arrow or a flow that will lead to a process that is symbolized drawing box, input, or an output with a symbol of a parallelogram in it explain the processes that are systemized to form a flowchart or flow chart of the registration

information system kkn made so that more clearly will be described in Figure 2 main page.

Flowchart:

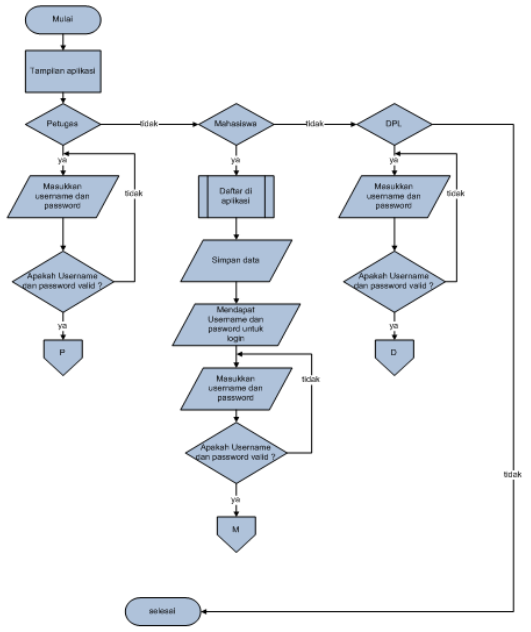

Figure 2. Main Page Flowchart

In Figure 2 the main page flowchart, the explanation is the main page flow on a pengabdian masyarakat information system that includes the field of Real Work Lecture. Describing the logic sequence of a troubleshooting procedure on the main page Flowchart has 3 users of officers, students and DPL (Dosen Pembimbing Lapangan).

b. Tier Diagram

Tiered diagram is a system design tool that can display the entire process contained in a particular application clearly and structured. Describes the structure of the system Form a tiered chart that describes all the processes that exist in the system.

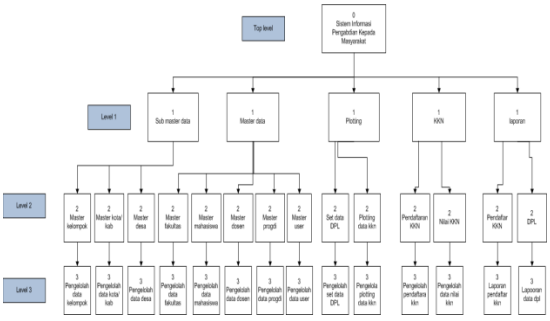

Figure 3. Tier Diagram

The following explanation of the process level on the tiered diagram in Figure 3 above:

1	Top Level	:	The main process of the information system used, only has a process with the symbol number 0, so that the diagram clearly visible then the name of the information system written on level 0 or top level
2	Level 1	:	The process after Top level, where level 1 will explain the existing menu on the information system created, with the number 1 in accordance with the number of processes in the information system
3	Level 2	:	Process after Level 1, where this process is a derivative of process level 1. Symbolized by sequence of numbers, if at Level 1 number 1 then at Level 2 then the number 1.1 and etc
4	Level 3	:	Process after Level 2, where this process is a derivative and explanation of process level 2. Symbolized with the sequence of numbers, if at Level 2 number 2 then at Level 3 then the number 3 and etc

c. Single Linkage

At this stage will be tested Single Linkage method used in the system of service devotion to the community covering real work college field. Thus it will get the results of the method calculation of the features used in the application.

In Single Linkage method used calculation of Agglomerative Hierarchy. To calculate the closest distance between objects and to form one group. Implementation of group tracing method to determine the number and students in the group of KKN using Single Linkage method has several stages of the calculation process, by the formula:

$$d_{(uv)w} = \text{Min}\ \{d_{min}, d_{max}\} \ldots\ldots\ldots\ldots\ldots (1)$$

Where :
d = results of outgoing groups
d (min) = Minimum Scramble value.
d (max) = Maximum Score Value

d. Physical Data Model (PDM)

PDM is a detailed description of the

database in physical form. PDM design depictions show the correct data storage structure in the actual data base. After being generated from CDM, 9 interrelated tables have been obtained and can be seen in Figure 4 below

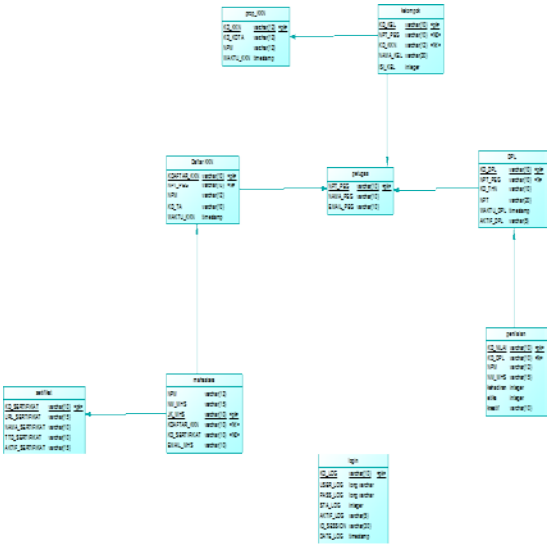

Figure 4. Physical Data Model

3.2. Web Application Experience

A. Experiment Of Random Design System Of KKN Group.

1. Registration KKN
   For Students who will register real work college, can fill in registration form data student KKN. In figure 5 below is a display form registration data student KKN. In this process an initial registration process will be carried out, but there is a process that this registration has been done by the Institute of Research and Community Service of the National Development University "Veteran" East Java, since the officer at LPPM already has a student database in the UPN Veteran East Java, this form is made to anticipate if the data or student name is not registered and can not login to this KKN system.

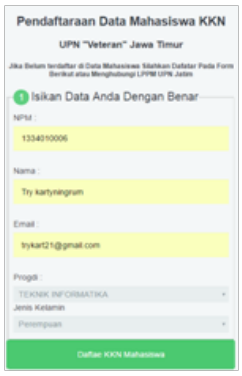

Figure 5. Form Registration

2. Form Upload KKN File
   This page is a New Registry of KKN where the access rights of students have already logged in and have uploaded the file and the KKN requirement, then automatically the student data will be stored on the New Registrar form of this KKN and the officer / pengelolah can also input the manual data of the student if the student has not upload the file and have not logged in, the officer can go to the button add data kkn participants to perform manual input on the system that has been provided as in figure 6 below.

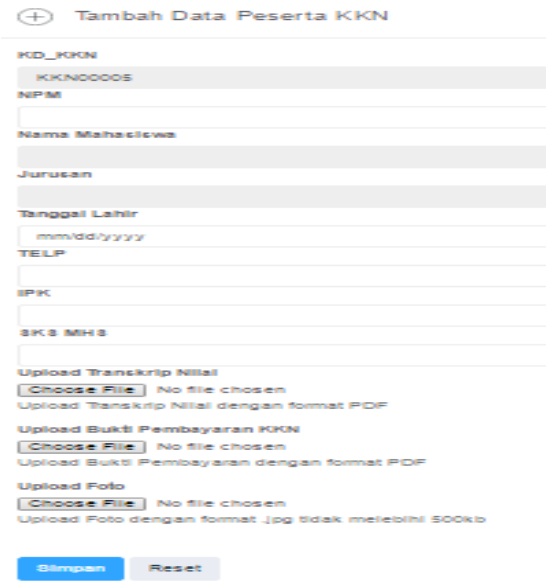

Figure 6. Form Upload

3. Random Group Algorithm
   On this page is a data page of KKN participants where the officers / managers can perform the process of

scrambling kkn group automatically, the figure 7 in button “Acak Kelompok” then automaticcaly in group KKN created, as in figure 7 below.

Figure 7. Random Group Algorithm Button

4. KKN View Data After Random Group Algorithm.
   When the data is randomized to get the result from the random group, then the officer can see the data of KKN participants can go to detail button KKN participants as in figure 8 below.

Figure 8. View Data KKN

Once selected button detail then the information that appears as in figure 9 below, where on the page also has been given a feature to move groups manually

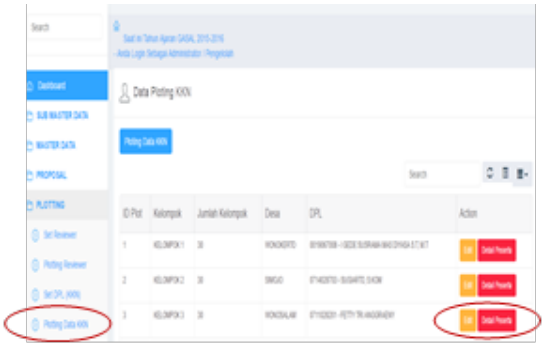

Figure 9. Manual Group Selection Process

5. Form Assesment of KKN Participant.
   In this figure 7 above there is Assessment button on the right side, where it later on login page from DPL can be done a process of appraisal to student which become its student at the location of KKN, for form stuff of value of KKN can be seen in figure 10 below

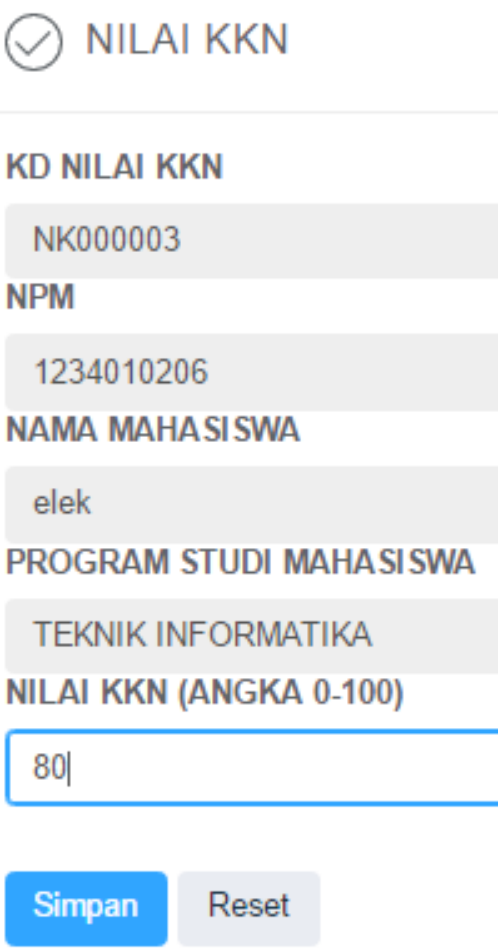

Figure 10. Form Assesment

In figure 10 above is a form kkn value, which where the name of the student has not been assessed by the DPL. If the value in the input more than> 100 then there is an error handling that the data is not true.

4. Conclusion.

Based on the results of the implementation of the test results and discussion of community service information system that includes real work college, so it can be concluded that:

a. A system capable of assisting LPPM officers, Dosen Pembimbing Lapangan (DPL), and students in facilitating activities related to the Registration of Real Work Lecture.
b. The system is able to process real work college data more efficiently and effectively so that there is no accumulation of paper files in LPPM

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