THE DESIGN AND IMPLEMENTATION OF MANAGEMENT INFORMATION SYSTEM ON STUDENT REAL WORK (KKN) IN MADURA UNIVERSITY

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ABSTRACT

The activities of Student Real Work Lecture (KKN) in University of Madura still have some obstacles. One of which is the length of process in choosing a place for KKN because of the continuous changes of temporary residence by many students. This process requires accuracy, because registered KKN participants should be provided a place that is in fairly close distance to their residence (boarding house/house) therefore causing various problems. The process is normally carried out by subjective assessment of the person in charge of KKN student manually. Therefore, to facilitate and assist the LPPM in determining the location of KKN, it is necessary to build a computerized Management Information System that could help the process of determining the location of the Real Work Lecture. Based on these problems, it is necessary to design and implement a management information system using Algorithms (Distance Matrix) that can help in determining the location of student KKN at Madura University. This community service aims to implement the MIS-KKN at Madura University to help improve the quality of Student Real Work Lectures.

Keywords: kkn, MIS-KKN, distance matrix.
1. INTRODUCTION

In line with the development of information technology, the ability of computers to help solve problems in various fields also increases. Almost every agency/company needs information that is fast, accurate, and precise. Therefore, there are many applications of computerized system to improve and facilitate processes that have been carried out manually.

The Institute for Research and Community Service (LPPM) is one of the units in the Madura University which is in charge of handling the Real Work Lecture (KKN) activities in every year. In terms of its history, the implementation of the Student Real Work Lecture (KKN) began in 1950 under the name of Student Deployment or Pengerahan Tenaga Mahasiswa (PTM). The idea of KKN is getting stronger with the mandate of the President of the Republic of Indonesia delivered in February 1972 at Gadjah Mada University (UGM). Since 1973, KKN officially became part of community service activities by students and a part of compulsory lecture activities at each University. KKN is a form of LPPM's commitment to realize the vision and mission of Madura University which is to organize education, research and community service. KKN activities have to do with the implementation of the theories obtained by students during the course aimed at contributing to the improvement of the society, competitiveness and to be more independent.

There are several stages in the placement of KKN students in rural areas. Before IT, students would be required to register in advance for selection and placement. In terms of placement, it requires some information to identify the students such as faculties, study programs, addresses, gender, size of clothes and photos of students. However, it is regarded to be less effective and less efficient because everything is still done manually. Therefore, it takes a long time for the data collection and placement process. This is because LPPM has to input the data of the student and reopen the existing data to determine the placement of KKN participants.

This research is a contribution of utilization. Therefore, it is necessary to convey the objectives to be achieved and the benefits obtained from this research. The objectives of this study include:

a) Creating a MIS-KKN application as a media for optimizing group division, group mapping and group reporting of KKN activities at Madura University which is held once a year.

b) Applying the MIS-KKN in group division and reporting at Madura University to help improve the quality of LPPM services. Therefore, it could facilitate DPLs in monitoring student activity reports in every week during KKN activities.

The advantages which were expected from this study are as follows:

1.1. Advantages for LPPM

It is to develop a more structured, effective and efficient KKN Information System. Therefore, it could produce a good performance for the relevant agencies. It also provides convenience in the formation and distribution of KKN members.
1.2. Advantages for students
It is to obtain a new knowledge about the real conditions in working world, especially within the scope of Informatics and could be directly involved in Informatics activities.

1.3. Advantages for Madura University
It could produce students who have insight and experience in their fields and could foster a good relationship between the academic environment and the Informatics environment.

2. RESEARCH METHODOLOGY

2.1. Data Collection Technique
   The methodology used to obtain data required is as follows:

2.1.1. Direct Research Technique
   It is a data processing technique where the research is carried out through direct observation of the examined objects. The researcher directly observed the activities of LPPM located at the campus of the Madura Pamekasan University. In this case, the object observed was the planning for the provision of student KKN activities, as well as the data on the KKN activities and details of the reports from previous years.

2.1.2. Direct Communication Technique or Interview
   This technique was carried out by collecting data and communicating directly with the LPPM officer. In this case, an interview with the LPPM was held. The author asked about the mechanism of the process of procuring KKN activities every year. According to him, every activity that would be held has been planned previously in general, such as the location of KKN. The location and the number of KKN groups are determined based on the number of KKN participants. There are several parameters considered in each KKN group. It involves the group name, group capacity limit based on each study program, DPL that will guide the group, and KKN group address. The consideration when forming the KKN group members is based on the distance of the student's address with the location of KKN. Furthermore, the data for DPL that was used by LPPM is taken from several Madura University lecturers who have information such as name, contact, and address. Student data is obtained when the KKN registration is opened by LPPM. The students who can take part in KKN must fulfill one of the requirements, such as the \textit{Ordik} period. Therefore, students could register and fill in some forms such as NPM, name, address, study program, telephone, work, credits that have been taken, as well as the uniform size. Furthermore, the researcher asked for the mechanism of the process when KKN activities have begun. In this case, it was explained by the weekly evaluation between students with DPL, student assessors and reporting of the final results during KKN activities.

2.1.3. Literature Review
   Literature review is a data collected through documented obtained from books, journals, or results gotten from the internet. At this stage, the researcher searched and understood the theories related to the programming tools and languages that was used and other theories that could assist in the process of analysis, design, and implementation of the planned program.
2.2. System Analysis

The analysis of the system includes the steps involved in creating Madura University Student Evaluation System. It is in order to define and describe the user's needs in detail. The following is the flow of system procedures on the MIS-KKN:

<table>
<thead>
<tr>
<th>No</th>
<th>User</th>
<th>Proses</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Admin</td>
<td>Login</td>
<td>Username, Password</td>
<td>Login information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KKN Academic Year Management</td>
<td>Tahun</td>
<td>Information of academic year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Admin Management</td>
<td>Username, Full name, Password</td>
<td>Admin data information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lecturer Management</td>
<td>Username, Full name, Contact number, Address</td>
<td>DPL data information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Student Management</td>
<td>Student ID, Full name, Program, Occupation, Contact number, Address, Number of taken credit, Size of uniform</td>
<td>Student’s data information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The validation of registered student</td>
<td>Student ID</td>
<td>Information of KKN candidates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KKN group management</td>
<td>Group name, Group capacity, Field supervisor (DPL), KKN Location</td>
<td>The information of KKN Group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The formation of KKN groups</td>
<td>Students who are not allocated</td>
<td>KKN location information</td>
</tr>
<tr>
<td>2</td>
<td>Field supervisor (DPL)</td>
<td>Login API Madura University</td>
<td>Username, Password</td>
<td>Login Information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Student’s Grade Management</td>
<td>Student ID, Score</td>
<td>Information of Student’s Score</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Submit upload</td>
<td>Uploaded file by students</td>
<td>Information of LPPM responds</td>
</tr>
<tr>
<td>3</td>
<td>Students</td>
<td>Login API Madura University</td>
<td>Username, Password</td>
<td>Login Information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KKN Registration</td>
<td>Student ID, Full name, Address, Program, Contact person, Occupation, The number of taken credits, Size of uniform</td>
<td>Registration information</td>
</tr>
</tbody>
</table>
2.3. The Flowchart of Admin System
In the flowchart of admin, system explains the flow of performance in the main web menu that could be seen and used by the Admin. More details could be seen in the following picture:

**Gambar 2.1 Flowchart Admin**

**2.3.1. DPL Flowchart**
The flowchart DPL could be seen in the following picture:
2.3.2. Student’s Flowchart

The flowchart of students could be seen in the picture below:

Figure 2.3 Flowchart of Students
2.3.3. Flowchart of Student Affairs Bureau

The flowchart of Student Affairs Bureau could be seen in the following picture.

![Flowchart of Students Affair Bureau](image)

Figure 2.4 Flowchart of Students Affair Bureau

2.4. System Design Database

In designing this MIS-KKN application, the database used was created using MySQL with Apache as its Web server.

2.4.1. Conceptual Data Model (CDM)

The CDM of MIS-KKN is a logical relationship between the relation table.
2.4.2. Physical Data Model (PDM)

The PDM of MIS-KKN application shows a physical relationship between relation tables as shown in the picture 2.7. below:

\[
\sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}
\]

2.4.3. The Participants Plotting Stages

The calculation of distance values based on student coordinates with KKN group coordinates was done using
Notes:

- $x_1$ is coordinate $x$ on student
- $x_2$ is coordinate $x$ on group
- $y_1$ is coordinate $y$ on student
- $y_2$ is a coordinate $y$ on group

3. RESULT AND DISCUSSION

3.1. Identifying Distance by Distance Matrix
This section explains how to identify the distance matrix to the formation of the KKN group. The data to be used is the trial data.

3.1.1. Student Data
In this section, the student data or participants who will be processed should already have the coordinate’s location in the form of Longitude and Latitude obtained from Google Map application.
3.1.2. KKN Group Data

Furthermore, there is also required that the KKN group data be available with the longitude and latitude coordinate.

3.1.3. Grouping

In this section, the student data were grouped based on the study program. Then sorted from the smallest to the largest based on the number of students in each study program.
3.1.4. Determining the Capacity of KKN Groups

Furthermore, the capacity of each KKN group was determined. From the data of students who have been sorted, the study code would be taken sequentially and entered into groups in turn and repeatedly according to the number of students available.

<table>
<thead>
<tr>
<th>NPM</th>
<th>PRODI</th>
<th>X</th>
<th>Y</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014220055</td>
<td>22</td>
<td>7.7</td>
<td>12.8</td>
<td>1</td>
</tr>
<tr>
<td>2014630003</td>
<td>62</td>
<td>4.8</td>
<td>12.8</td>
<td>1</td>
</tr>
<tr>
<td>2013310167</td>
<td>31</td>
<td>8.6</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2014310038</td>
<td>31</td>
<td>9</td>
<td>12.6</td>
<td>2</td>
</tr>
<tr>
<td>2014510167</td>
<td>51</td>
<td>24.2</td>
<td>7.3</td>
<td>2</td>
</tr>
<tr>
<td>2015510011</td>
<td>51</td>
<td>11.8</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>2014610019</td>
<td>61</td>
<td>29.3</td>
<td>11.8</td>
<td>2</td>
</tr>
<tr>
<td>2014610004</td>
<td>61</td>
<td>11</td>
<td>19.3</td>
<td>2</td>
</tr>
<tr>
<td>2014620050</td>
<td>62</td>
<td>19.2</td>
<td>9.3</td>
<td>2</td>
</tr>
<tr>
<td>2014620002</td>
<td>62</td>
<td>31.4</td>
<td>15.2</td>
<td></td>
</tr>
<tr>
<td>2014410025</td>
<td>41</td>
<td>23.1</td>
<td>7.6</td>
<td>3</td>
</tr>
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<td>2014410028</td>
<td>41</td>
<td>10.8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>2014410029</td>
<td>41</td>
<td>14.7</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
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<td>52</td>
<td>17</td>
<td>8.5</td>
<td>3</td>
</tr>
<tr>
<td>2014520205</td>
<td>52</td>
<td>21.9</td>
<td>12.4</td>
<td></td>
</tr>
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<td>24.2</td>
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<td>12.1</td>
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<td>27.2</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>2014210120</td>
<td>21</td>
<td>26.6</td>
<td>17.3</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL 21

3.1.5. Calculating All Student Distance Values

The calculation of distance values based on student coordinates with KKN group coordinates would be done using the formula:

\[
\sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}
\]

Notes:
- \(x_1\) is coordinate x on student
- \(x_2\) is coordinate x on group
- \(y_1\) is coordinate y on student
- \(y_2\) is a coordinate y on group
Therefore, the writing form of formulas are as follows:

\[ D(2014220055,A) = \sqrt{(7.7 - 23.2)^2 + (12.8 - 19.9)^2} = 17.40875 \]
\[ D(2014220055,B) = \sqrt{(7.7 - 19.2)^2 + (12.8 - 15)^2} = 11.70854 \]
\[ D(2014220055,C) = \sqrt{(7.7 - 29.3)^2 + (12.8 - 18)^2} = 22.21711 \]
\[ D(2014220055,D) = \sqrt{(7.7 - 11.5)^2 + (12.8 - 31.4)^2} = 18.98422 \]
\[ D(2014220055,E) = \sqrt{(7.7 - 24.2)^2 + (12.8 - 28.5)^2} = 22.77586 \]

The figure above shows the calculation of the distance of students with Student ID 2014220055 to groups A, B, C, D, E. Calculations were carried out on all students.

### 3.1.6. The Formation of KKN Groups

Furthermore, in the process of establishing KKN groups, after the capacity has been determined and all the distance values of students to the group have been obtained, the distance values to the number of groups available were compared. Because there are five groups, therefore, the comparison would be done five times.

#### 3.1.6.1. First Comparison

Take the students based on patterns in the group capacity. Take the smallest distance value and accommodate it to the comparison group. Then add each student's distance value in the comparison group. Then select the smallest result from the sum of the results.

Because the smallest result in the comparison group is "B", then the students who are entered into the KKN "B" group are students in the "B" comparison group.

#### 3.1.6.2. The Second Comparison

Similar to the first comparison process, the data of students in the second comparison process who have entered the KKN group does not need to be compared again.
Because a group has been formed in group B, then, there is no need for comparison again. In the current comparison group, the smallest result is the KKN “C” group.

3.1.6.3. The Third Comparison

The third comparison is similar to the second comparison process. Therefore, the results of the comparison are as follows.

3.6.1.4. The Fourth Comparison

The fourth comparison process is similar to the third ones. Therefore, the results of the comparison are as follows.
3.1.6.5. The Fifth Comparison

The fifth comparison process does not need to be compared again, because there is only one group left. Therefore the "D" group is formed with students in the comparison group. The remaining students would occupy the KKN group with random capacity. Students are determined based on the closest distance to the KKN group. The following table is the result of the formation of the KKN group.
3.1.7. Interface Discussion
This section discusses the form on the menu in the Madura University Real Work Lecture Information System. Here is the interface with the different access rights, including:

3.1.8. THE MIS-KKN Interface

3.1.8.1. Login Page
This page is used to log in to the system by entering the “Username” and “Password”

![Figure 4.1 Login Page](image)

3.1.8.2. KKN Group Page
This page shows the data management of KKN groups. This data will be formed by student KKN activities. The attributes found in this KKN group page include "Group Name", "Capacity", "Address" and "DPL".

3.1.8.3. KKN Map
This feature provides information on KKN participants that are located in each KKN group which is packaged in the form of a map. Therefore, it would be easier to see the distance of KKN participants to KKN groups. To open this feature, click the "Statistics KKN" menu on the side left then enter the "KKN Map" menu. The following KKN map picture is displayed.
3.1.8.4. KKN Performance

This feature provides information such as files uploaded by KKN participants or KKN groups, files submitted by DPL, and KKN participant values. To open this feature, click on the "Statistics KKN" menu on the left side and enter the "KKN Performance" menu. The following picture is the displayed of KKN performance menu.

4. CLOSING

4.1. Conclusion

Based on the results of this study, it could be concluded that there are several things with respect to KKN activities in Madura University LPPM, including

1. MIS-KKN could help the Madura University LPPM in handling KKN activities.
2. MIS-KKN could help students during registration of KKN.
3. MIS-KKN could help DPLs in different ways such as in evaluating weekly reports.
4. MIS-KKN could be used as a recapitulation of Student data and Lecturer data because the data has been synchronized with the master system data on the Madura University campus.
5. MIS-KKN could be used as a rapid formation of KKN groups by considering the distance between students and KKN groups.
6. MIS-KKN could be used as a reporting medium through uploading of ".pdf" file, so that KKN reports will be stored digitally.
7. MIS-KKN plots participants to KKN groups not to fully obtain the expected results. Because there were several participants who found a remote KKN group from the location of the participants to the KKN location. This was due to limitations on the formation of the Group.

4.2. Suggestion
There is need to develop this system further. A broader interest in the system will make it better and the things that could be developed include getting new algorithms for the plotting process or the formation of KKN groups.

BIBLIOGRAPHY