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Integration of the Community Development Program (KKN) Application with the Student Activity and Achievement System (SADEWA) of Universitas Pembangunan Nasional "Veteran" Yogyakarta

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Abstract

Community Development Program (KKN) is one of the activities that must be carried out by all UPN "Veteran" Yogyakarta students to apply the knowledge that has been acquired during their studies as well as a tangible form of service to the general public. To help smooth the KKN activities, it is necessary to manage data related to KKN activities in a centralized manner. The purpose of this research is to produce an integration scheme of the KKN application with the Student Activity and Achievement System (SADEWA). The integration scheme is mapping the same data and combining the data currently under KKN with the SADEWA System so that student activities and academic/non-academic achievements are in one master database. The integration of the KKN application with SADEWA will facilitate the implementation of KKN starting from the registration of KKN activities, DPL information, location information, and online monitoring of performance and improvement of accurate and accountable master data. The result of this research is an integration scheme of the KKN application (real-time lectures) with student activity applications.

Keywords: System Integration, Mapping Data, Database Master, Web Service

I. INTRODUCTION

1.1 Research Background

Nowadays, the need for information is a primary need in almost all fields, including education, tourism, and society in general. This can be seen from the increasing demand for supporting information in various activities such as community development programs (KKN). Data management in the implementation of KKN activities requires good data documentation and accurate master data (Fandatiar, Supriyono, & Nugraha, 2015). The KKN application must be able to accommodate several processes needed in the implementation of KKN activities, including data management regarding KKN registration, division of KKN groups, division of time and place for implementing KKN, division of field supervisors (DPL), and the process of assessing the results of KKN. There are many obstacles in delivering information related to the implementation of KKN activities, for students who want to know information about KKN, both regarding requirements, registration, time, and place of implementation are still deemed inadequate. To solve the problems

above, an alternative is needed by making an integration scheme of the KKN application with the SADEWA system.

UPN "Veteran" Yogyakarta is one of the new state universities that continue to innovate in order to improve the quality both in terms of human resources, learning infrastructure, research, and also its graduates. Moreover, entering the industrial era 4.0, every university is required to create graduates ready to compete in the world of work. The graduates must have a balanced ability of hard skills and soft skills so that students are required to be active and have achievements in both academic and non-academic fields.

In computer science and information technology, there are terms of data integration and systems integration. Data integration is a process of combining or combining data from different sources to support information management and support users to see the unity of data (Santosa & Perwira, 2017). Data that is integrated is data from various database sources into storage such as a data warehouse.

Data integration requirements can be fulfilled in various ways, such as consistent in variable naming, consistent in varying size, consistent in coding structure, and consistent in physical attributes of data. The problems that exist in data integration are data heterogeneity, data source autonomy, correctness, and performance of queries/requests, while system integration is a system concept that can relate to one another in various ways according to needs, this is very useful if a data in a file system is also needed by another system or the output of a system becomes another system input. The advantage of this system integration is the improvement of information flow in an organization. A report usually takes time; however, more relevant information in managerial activities can be obtained if needed.

Integration of Information Technology (IT) across independent business units is a challenging business, mainly due to the different standards for IT infrastructure and applications in each unit. To ensure its success, IT governance mechanisms are needed to minimize the risks (Vande & Yuwono, 2009). Information technology is no longer a compliment but is a necessity in the academic world, especially universities. Along with advances in information technology, the online administration process will make it easier for educational institutions to monitor tri dharma activities and student activities. This is comparable to the three essential roles of information systems for organizations according to Alter (Alter, 1992), quoted from Kadir (Kadir, 2003), namely:

a) Participate in the implementation of tasks.
b) Linking planning, quality, and control in a subsystem.
c) Coordinating and integrating subsystems.

With the current COVID-19 outbreak, at least several universities have implemented online lectures (online). Administrative activities that are carried out face-to-face must be carried out online must be proven by accurate and valid data. The integration of the KKN application with SADEWA will facilitate the implementation from the student side and LPPM as the manager of KKN activities.

Based on several existing references, this research focuses on the integration scheme of the KKN application with the Student Activity and Achievement System (SADEWA), in the future, this system will become a master of student data starting from seeing academic, non-academic, achievement, KKN, recovery results. status, payment history, and services attached to students are at one service gate.

1.2 Problem Statement

From the above background, the formulation of the problem in this study is How is the integration scheme of the KKN application with the SADEWA System using the API service so that it can improve the quality of the UPN "Veteran" Yogyakarta database?

1.3 Research Benefits

The benefits expected from this research are

1. Facilitate registration of KKN activities.
2. Record data in a single quality database.
3. Helping the academic community, in particular, students, DPL, and LPPM to continue to recap and report KKN activities during the COVID-19 period.

1.4 Research Objective

The objective of this research is to implement a data integration scheme of the KKN application with a system of student activities and achievements so that it becomes an accurate master database.

II. LITERATURE REVIEW

II.1. System

Quoted from the Enterprise Information System, O'Brien and Marakas (O'Brien & Marakas, 2007) define that the system is a collection of several interconnected components, clear boundaries of the tasks and functions of each part that work together to achieve one goal. The system definition according to Jogiyanto (Jogiyanto, 2006) is a collection of elements that interact to achieve specific goals. This system describes the facts of events such as places, things, and people that happened. Some of the characteristics of the plan (Fatta, 2007) are:

a) Limits. The description that shows what is included in the system and which is outside the system.
b) Environment. Everything that is outside the system.
c) Input. Resources or everything that comes from the internal system and is consumed and manipulated by the system.
d) Output. Resources that are the result of the system.
e) Process. Activities or processes in the system that inform inputs into outputs.
f) Control. A process of monitoring and managing the subsystems in carrying out the process.
g) Feedback. An assessment mechanism or provide input on what has been processed.

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II.2. Information

Understanding information according to Kenneth C. Loudon (Loudon, 2016) is data that has been processed into a form that is useful and can be used for humans. Meanwhile, according to Jogiyanto (Jogiyanto, 2006), information is data that has been processed into a form that is more useful for those who receive the information. Information itself can be in the form of messages, voices, data to have meaning and can provide input to strategic policymakers. Data is the knowledge that is communicated. The information itself has the following characteristics (Davis, 1999):

a) The information can be true or false.
b) Information is New.
c) Information can be in the form of additional.
d) Information can be used for correction.
e) Information reinforces existing information

II.3. Information System

The information system, according to Hall (Hall, 2001) cited by Kadir (Kadir, 2003) is a series of formal procedures in which data is grouped, processed into information, and distributed to users. In fact, the information system does not have to involve Information Technology (hardware). Before technology, information systems ran manually without using machines or computers. Information systems that use technology or computers are called computer-based information systems. But in practice, the existence of hardware cannot be separated from the information system. Some examples of information systems are:

a) Academic information system
b) New student information system
c) Personnel information system
d) Ticket reservation information system
e) Tourism information systems, etc.

II.4. Web Service

Web Service is one form of implementation of an N-tier architecture placed on a business services tier, which means that only functions are available that can later be used by an application (Hadiwinata, 2002). Web services are components or service application objects to consumers that are exposed to client applications via Internet standards such as XML and HTTP (Suryo, 2003). In essence, Web Service can be concluded as follows (Dwi, 2003):

a) Is a logical application that can be accessed and published using Internet standards (TCP / IP, HTTP, Web)
b) Described in XML format
c) Identified with a Universal Resource Identifier (URI)
d) Loosely coupled self-contained, modular, and open (non-proprietary)
e) Used to support machine to machine interaction interoperability via the Internet / Intranet.

III. RESEARCH METHODOLOGY

III.1. Research Methodology

The research method used as a flow to obtain primary and secondary data is

1. Literature Study
   This stage is the stage of gathering information and literature needed for the creation of KKN applications, integration schemes, web services. The information and literature used include data attributes in the KKN application and parameters of student academic and non-academic achievement.
2. Interview
   This stage is carried out to obtain information about the KKN application to ICT staff, LPPM staff, and students who have taken KKN

III.2. Software Development Methodology

The development methodology used in this research includes the waterfall method used in designing software development (Pressman, 2012). The method image is presented in Figure 1 below:

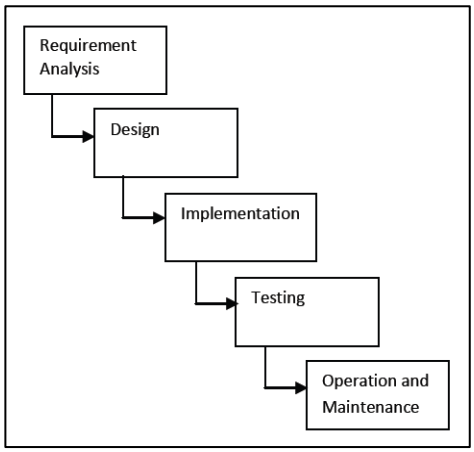

Figure 1. Waterfall concept

The stages of the waterfall method:

1) Needs Analysis Stage
   At this stage, it begins to determine services, limits, and system objectives are determined in consultation with the system user. These requirements are then defined in detail and serve as system specifications.
2) System Design Stage
   The system design process divides the requirements into a hardware or software system. This activity determines the overall system architecture. Software design involves identifying and describing the basic software system abstractions.
3) Program Code Writing / Implementation Phase
   At this stage, software design is related to a series of programs or program units.
4) Program Testing Phase
   The program unit is tested as a complete system and the system is said to be good. System testing is done in black box testing. The testing phase carried out is the alpha test and beta test.
5) Maintenance Stage
   The final stage in the waterfall model. The finished software is run and maintained. Maintenance includes fixing errors that were not found in the previous step.

II1.3. Arhitecture

The system architecture is a description of the overall system workflow. Users in this system consist of student, lecturer, and admin user levels. Users will use the SADEWA web client as usual. Users enter the web by logging in using their username and password.

The service request process occurs when the user performs a CRUD (Create, Read, Update, Delete) process against the accessed menu, then from that process will automatically send an HTTP request method (GET, POST, PUT, DELETE) and call the service API and send parameters data as a

reference. Furthermore, the server will call the API service according to the request from the user, and process the data using a query on the database. After that, it sends back the query results and the service return value from the server to the web client. Here is the architecture.

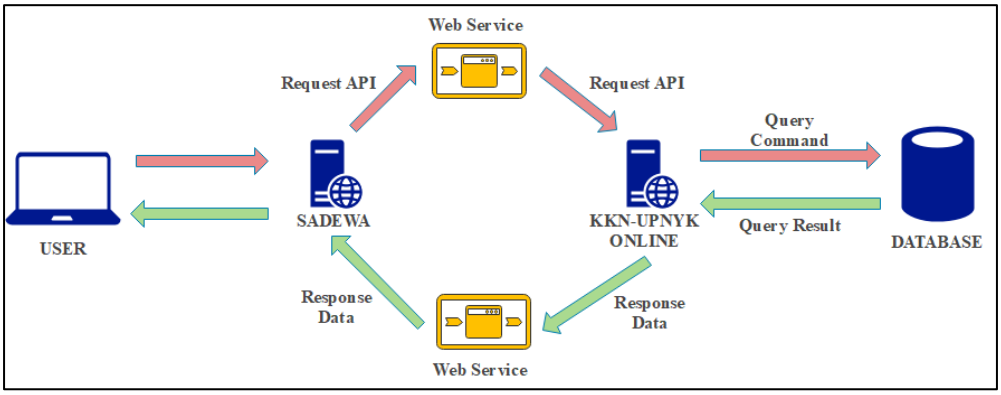

Figure 2. Architecture

III.4. Flowchart

Based on the flowchart of the registration system process through the online KKN system, the registration process is carried out for the first time by students by inputting the data needed during the registration process, including personal bio, biodata of parents/guardians, and information on the size of clothes and students. In this process, students are also required to upload several supporting files, including Student Identity Cards (KTM), Study Plan Cards (KRS), statement letters, transcripts, and fulfilling the number of credits that have been taken.

The next process is carried out by the admin, namely verifying the data that has been entered by students when registering. Verification results will be sent via email. In this process, the admin will also determine the group, the location of the Community Service Program, and the Field Supervisory Lecturer (DPL). Furthermore, if the verification is successful, students upload the KKN proposal file to the system. If they have met the filing requirements, students can undergo KKN activities for a predetermined time. When the KKN time has ended, the DPL will input the value according to the KKN results that the student has done.

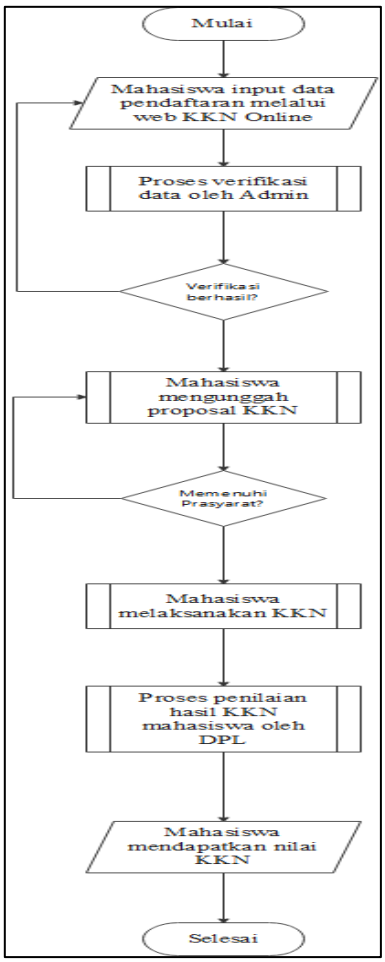

Figure 3. Flowchart

IV. FINDING AND DISCUSSION

IV.1. User Side System

1. Dashboard Page

On the home page, there are several instructions that must be understood by students before registering. Here's how it looks.

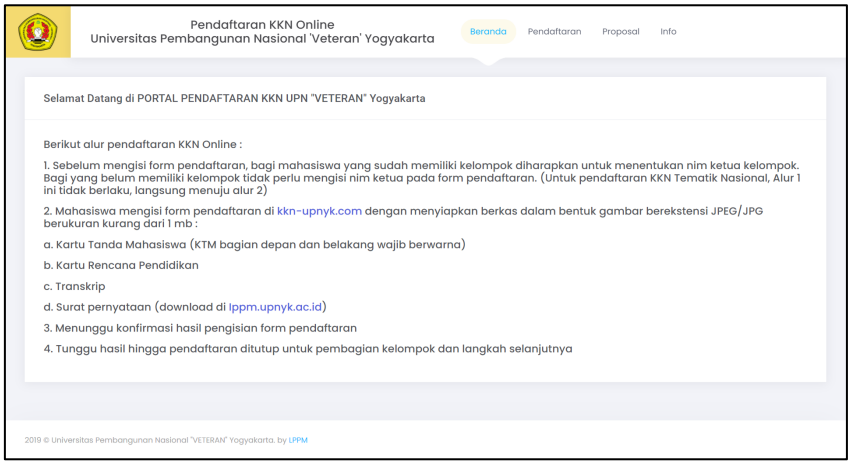

Figure 4. Dashboard

2. Registration Page

On the registration page, there are five steps that must be taken by students as a series of registration processes, namely the first step to fill in the biodata, second to fill in the biodata of parents/guardians, third to fill in the information on clothes sizes, fourth to upload files and fifth to review the input that was made before clicking the list button.

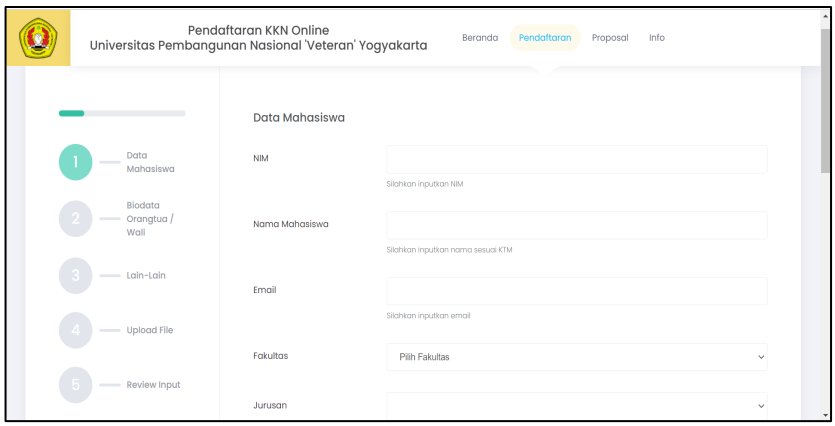

Figure 5. Registration Page

3. Upload Proposal

If students have received verification from the admin regarding their approval to take part in KKN, students can directly upload their KKN proposals by accessing the 'Proposal' menu. On this menu students only input the NIM of the chairman, name of the group, and upload the KKN proposal file. Here's how it looks.

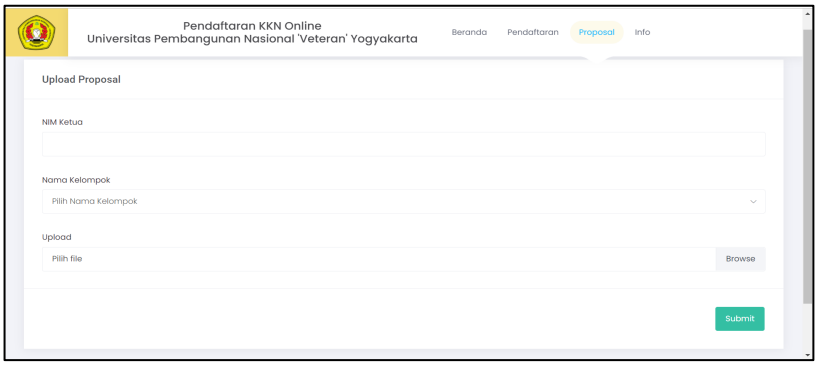

Figure 6. Upload Proposal

4. Information Page

Students can access information about KKN on the info menu. There are several guidelines that students must know regarding the implementation of KKN, namely KKN requirements, KKN choice forms, provisioning, discharge, placement, and withdrawal of KKN, compulsory KKN programs, and permits that can be done while doing KKN. Here's how it looks.

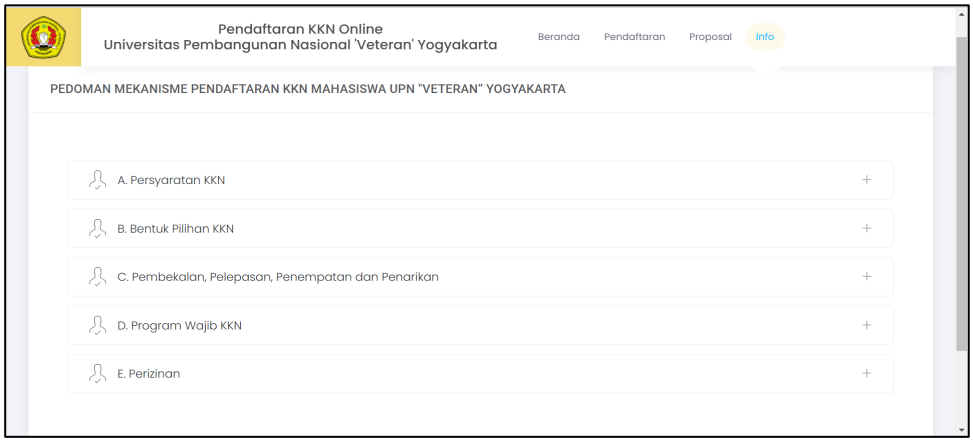

Figure 7. Information Page

IV.2. Admin Side

1. Dashboard admin

Admins can perform several tasks, namely being able to perform the CRUD (Create, Read, Update Delete) process on the data used for the online KKN registration process. These data are user, faculty, department, group, student, DPL, location and report data. Not only that, but the admin also carries out the student registration verification process.

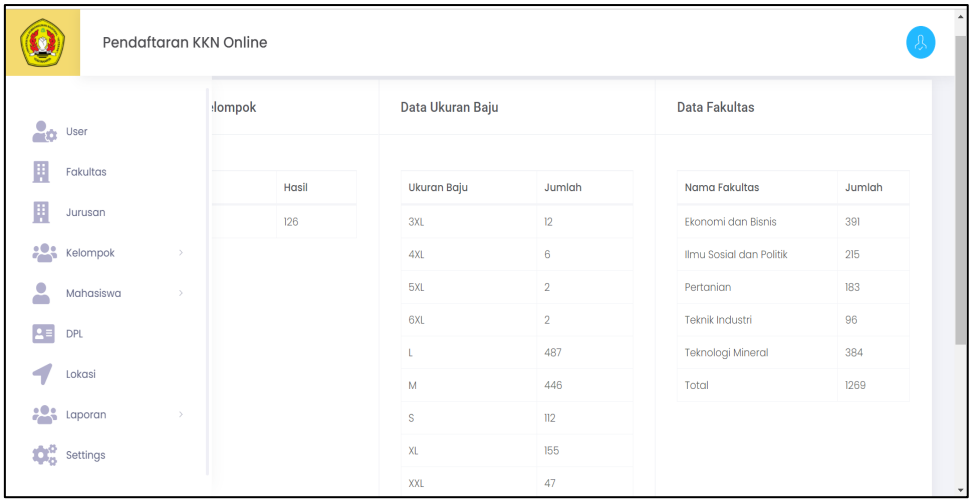

Figure 8. Admin Side Page

V. CONCLUSION AND FURTHER RESEARCH

The problem is that the KKN database is still independent. This causes data redundancy during the input process. A comprehensive solution mechanism is needed that can unify these data as required. This study concludes that it has successfully integrated two applications, namely the KKN application with the student application using the web service scheme. This application has been running as it should. During the current period of COVID19, of course, the implementation of KKN starting from registration, monitoring to implementation needs to be monitored and carried out using an online integration scheme. The integration of the KKN application with SADEWA will facilitate

the implementation of KKN starting from the registration of KKN activities, DPL information, location information, and online monitoring of performance and improvement of accurate and accountable master data.

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