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Integrated Validation System (IVS) Design for Proposal Submission of Student Activities at PPNS

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Abstract. The concept of Industry 4.0 is a combination of new technological developments that aim to facilitate human-computer interaction. Higher Education Institutions are currently not separated from the development of the industrial revolution involvement 4.0. Technology has a tremendous influence in the running of all activities of daily living, not least the performance of management in institutions of Higher Education Institutions. The demand to be able to work more effectively and efficiently in producing a product both in the form of goods and services makes PPNS have to keep up with technological developments. PPNS is expected to produce a product, both goods and services, in accordance with the expectations of the stakeholders (students, society and lecturers-employees). One of the problems that often becomes a problem is the bureaucracy that has a long flow. In this study, problems that occur in the PPNS Student Affairs Sector will be raised, namely regarding the approval of student activity proposals from the Student Association (HIMA) by the PPNS Management in Student Affairs under Deputy Director III.

There are several steps that can be assisted in the process by using technology, so as to increase the effectiveness of performance in student affairs. Based on these problems and opportunities, a study is proposed with the title Integrated Validation System (IVS) Development to Optimize Student Service Performance in PPNS. With this system, it is hoped that it will help optimize the performance in the field of student affairs so that it can be more effective and efficient in serving requests for student activities at PPNS

Keywords: *Integrated Validation System, technology, Design System, Proposal Submission*

1 Introduction

Technology has a tremendous influence in carrying out all daily activities, including management performance in tertiary institutions. At this time all activities are required to be more effective and efficient in producing a product both in the form of goods and services. The current Higher Education Institution (PT) cannot be separated from the involvement of the development of the industrial revolution era 4.0. The concept of Industry 4.0 is a combination

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of new technological developments that aim to facilitate human-computer interaction (Fauzan, 2018).

One of the problems that often occur in management performance is the bureaucratic problem that has a long flow. According to O'Brien and Marakas, an organization consists of a number of resources that work towards the achievement of a certain goal determined by the owner or management, so that the bureaucratic process should be shortened (O'Brien & Marakas, 2011).

According to Marlinda (2004), one way of presenting data to facilitate modification is by means of data modeling. One of the models that will be discussed is the Entity Relationship Model. Entity Relationship Model is a logical representation of data in an organization or a certain business area using Entity and Relationship. Entity Relationship Diagram (ERD) is the main data modeling tool and will help organize data in a project into entities and determine the relationships between these entities (Wibowo, Santoso, & Rahman, 2013). In this study, the Iconix process will be used. The ICONIX process is a design / development method using a use case. Use cases will be determined at the beginning of development and become the basis for determining the model and behavior of the system to be built (Rosenberg & Stephens, 2007).

In this study, problems that occur in the PPNS Student Affairs Sector will be raised, namely regarding the approval of student activity proposals and the disbursement of HMP funds from the Student Association (HIMA) by the PPNS Management in Student Affairs under Deputy Director III. The need for verification and approval by the Secretary of the HMP (HIMA Prodi), lecturers of the Student Consultation Team (TKK), Study Program Coordinator, Head of Department, Student Coordinator (field III), and Deputy Director III is quite a long path (takes up to 2 weeks) , and all must be done using paper documents. Often due to the busyness and high mobility of the personnel who carry out the verification and approval, these documents will be slow to process, so they have to wait for free time from each person.

2 Method

2.1. Identification of problems

Identification of the problem in this study is to identify the SOP that applies at the stage of submitting a proposal by students to the Deputy Director III for Student Affairs. The method used in identifying this problem is by conducting interviews with the Student Affairs Division regarding the existing flow in the SOP. So that we get problems that may arise during the process, especially those that cause performance so far to be less effective and efficient.

2.2 Literature Study

At the literature review stage, the research team tried to find literature that would be a strong theoretical basis or basis from the time of analysis to the time of making the system. With this basis, the results that will be obtained from this research can be justified scientifically.

2.3 Selection of System Development Methods

The choice of system development method is adjusted to the state of the object that will use the system. The author chooses to use the ICONIX Process method to support the creation of an Integrated Validation System. One reason is that the ICONIX Process is in the middle between the broad Rational Unified Process (RUP) approach and the very narrow eXtreme Programming (XP) approach. The ICONIX Process scope is narrow and short like in XP, but prioritizes analysis and design like that of RUP.

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In theory, every aspect of UML is potentially useful, but in practice, there never seems to be enough time for modeling, analysis, and design. The main purpose of the ICONIX Process is to bridge how to code a program based on the use case that has been made.

2.4 Designing the System

At the system design stage, researchers will find out about the technology that will be used later, whether using a computer using the internet network or using a mobile application. The results of this search will provide information to researchers when designing the following system:

1. Designing a database consisting of: use case diagrams, robustness diagrams, sequence diagrams, class diagrams.
2. Designing a user interface using a prototype.

2.5 Developing the System

The development process will carry out testing so that later the system can be ready to be used to optimize the performance of student services.

2.6 Testing the System

At this stage, tests are carried out related to the system that has been developed, whether it is running and can help the performance of the student affairs sector properly and as desired. If there are still deficiencies, repairs will be made. system development stage is the stage where the results of the previous design will be implemented in real terms and the results can be used to carry out the integrated validation system (IVS) process.

2.7 Analysis of Research Results

At this stage the system can work and it can be seen how much it is effective and efficient when used in daily activities, so that it can be analyzed to draw conclusions for this research.

3. Result and Discussion

Entity Relationship Diagram Design (ER Diagram)

The Integrated Validation System (IVS) designed is a development of the manual system that has been done so far, so that the business process is designed to form the database using a relational database design (ER Diagram), as shown in Figure 3.1 below

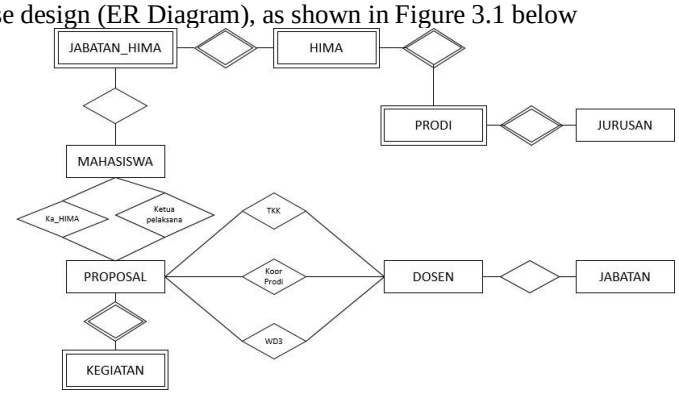

Figure 3. ERD *Integrated Validation System* (IVS)

From the ER diagram above, it is then determined the attributes that will be used in the system, according to the existing instructions in the previous manual system. The attributes that

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will be included in the system are attributes that are important to be used as material for consideration of whether a student activity proposal is accepted or rejected. Data Requirements Analysis (Entities and Attributes)

From the ER diagram in Figure 1, a relationship (table) is created which will be implemented in the XAMPP software. In the XAMPP program, the application that handles the database is MariaDB (MySQL). The form of the relation (table) from the ER Diagram in Figure 1 will be equipped with attributes that will complement the database. The following in table 3.1 is a table showing the attributes and data types of the Proposal table:

Table 3.1 Proposal Table

ATRIBUT	DATA TYPE
no	varchar (5)
tanggal	date
judul	varchar (100)
abstrak	text
kata_kunci	text
nrp_pelaksana	varchar (10)
nrp_kahima	varchar (10)
nip_tkk	varchar (12)
nip_koprodi	varchar (12)
nip_wd3	varchar (12)
biaya_usul	int(11)
biaya_mandiri	int(11)
biaya_sponsor	int(11)

The following in table 3.2 is a table showing the attributes and data types of the Activity table

Table 3.2 Activity table

ATRIBUT	DATA TYPE
no_proposal	varchar (5)
no_Kegiatan	varchar (2)
nm_kegiatan	varchar (50)
tujuan	text
tgl_pelaksanaan	Date
range_waktu	varchar (12)
peserta	text
pic_acara	varchar (50)
tolak_ukur	text

The following in table 3.3 is a table showing the attributes and data types of the Lecture table

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Table 3.3 Lecture Table

ATRIBUT	DATA TYPE
nip	varchar (12)
nm_dosen	varchar (50)
hp	varchar (12)
email	varchar (20)
kd_prodi	varchar (2)

The following in table 3.4 is a table showing the attributes and data types of the Study Program table

Table 3.4 Study Program Table

ATRIBUT	DATA TYPE
kd_jurusan	varchar (2)
kd_prodi	varchar (2)
nm_prodi	varchar (50)

The following in table 3.5 is a table showing the attributes and data types of the Majors table

Table 3.5 Majors Table

ATRIBUT	DATA TYPE
kd_jurusan	varchar (2)
nm_jurusan	varchar (50)

The following in table 3.6 is a table showing the attributes and data types of the Jobdesk table

Table 3.6 Jobdesk Table

ATRIBUT	DATA TYPE
kd_jabatan	varchar (2)
nm_jabatan	varchar (20)
nip	varchar (12)

The following in table 3.7 is a table showing the attributes and data types of the Student table

Table 3.7 Student Table

ATRIBUT	DATA TYPE
nrp	varchar (10)
nm_mahasiswa	varchar (50)
hp	varchar (11)
alamat	varchar (50)
email	varchar (20)

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kd_prodi	varchar (2)

The following in table 3.8 is a table showing the attributes and data types of the HIMA table

Table 3.8 Hima Table

ATRIBUT	DATA TYPE
kd_hima	varchar (2)
nm_hima	varchar (30)
kd_prodi	varchar (2)

The following in table 3.9 is a table showing the attributes and data types of the HIMA_Position table

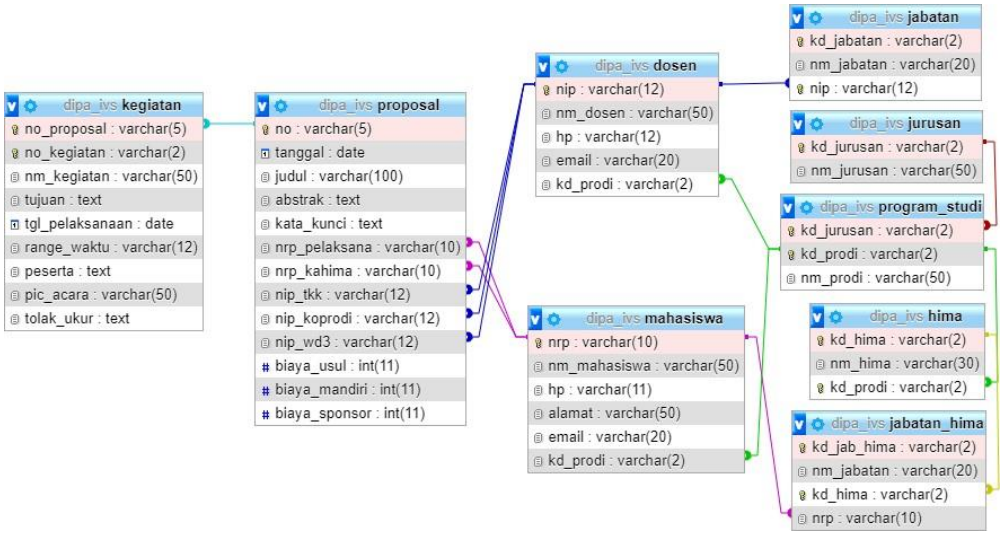
Table 3.9 HIMA_Position table

ATRIBUT	DATA TYPE
kd_jab_hima	varchar (2)
nm_jabatan	varchar (20)
kd_hima	varchar (2)
nrp	varchar (10)

After being equipped with attributes and data types, the ER diagram design will be converted into a physical design that will be entered into the database application (MySQL).

Create Database

The physical table form will be implemented in MariaDB (MySQL) as shown in the following figure:



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4 Conclusion

Efforts to increase the effectiveness and efficiency of the proposal submission process and the disbursement of HMP funds, a system was created that could integrate several parts / divisions in the work process for submitting proposals and disbursing HMP funds. With the integrated validation system, which is a website-based application that is able to provide convenience for users both by the management team of student affairs, finance, ULT and HMP in monitoring the submission of activity proposals to disbursing HMP funds in real time and can also reduce document processing time. Meanwhile, the system for submitting activity proposals and disbursing HMP funds currently still uses manual methods, namely the submission process is still not integrated by the online system and takes approximately 2 weeks to process.

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