Development of Student Associations Information System at Universitas Pembangunan Nasional Veteran Jakarta

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Abstract – **Universitas Pembangunan Nasional Veteran Jakarta (UPN Veteran Jakarta) is one of the public universities which views student associations to play an important role in student self-development. Student's self-development can be realized if students participate in every activity. but a lot of problems that occur because the process related to student association is still done manually without using an information system, where students have to come to campus to take care of all the needs to hold an activity. So that we need a system that aims to improve services to student associations as well as facilitate the management of existing student associations data and can increase the credibility of UPN Veteran Jakarta itself. It is called SIWA. It is expected to minimize errors that occur and manage business processes that exist in each student association. So that the benefits of the system are that information on Real Estimate of Cost, submission of activity proposals, accountability reports and annual reports can be managed properly, minimize errors that occur and manage business processes that exist in each student association. Besides that, it can also support a paperless culture in the college environment. This information system is built based on a web-based system and its development uses the waterfall method.**

Keywords – Information System, Waterfall, Student Associations.

I. INTRODUCTION

In the development of technology era where technology can be found in all areas. Most organizations need to digitize business processes in their organization. Especially with the Covid-19 pandemic, organizations are necessary to optimize service from offline to online service. UPN Veteran Jakarta as a higher education institution recognized student associations have an important role as a medium for student's self-development. Student's self-development can be realized if students participate in every activity. On the other hand, student association have some problems in reporting activities in UPN Veteran Jakarta, especially in this pandemic where students must comply with existing health protocols and sometimes activity data is not stored properly so it is troublesome when they want to be reviewed. This happens because the process related to student association is still done manually without using an information system, where students have to come to campus to take care of all the needs to hold an activity.

Several studies have been conducted regarding student associations, Kurniawati, Hari and Darmanto [1], conducted research on the information system for the administration of student association activities (SIPAWA) at Widya Kartika University, Surabaya. This application is built using the Waterfall method. This system is used as a student association administration management information system (SIPAWA), Real Estimate of Cost information system, submission of student activity proposals, accountability reports and so that annual reports can be managed properly.

Research in this scope is also done by Ardian, Suryawan and Hartono [2], they make a system to manage the administration of student associations to help the institutions carry out supervision and guidance of student organizations at STIMIK STIKOM Indonesia. Meanwhile, the analysis and design used in this study is Structured Analysis and Structured Design method. The information system development uses Statement of Purpose (SOP), Event List, Context Diagram, Data Flow Diagram (DFD). Database design is done using the Entity Relationship Diagram (ERD). This system will provide information about the condition of student associations. Assessment of the condition of student associations is based on the activeness of student association member, the number of activities, student participation in student association activities, and discipline in student associations in terms of administration. The assessment was carried out using the Simple Additive Weighting (SAW) method. Furthermore, the development of the archive digitization application for the secretariat of student association in the STIMIK STIKOM BALI was carried out by Yuningsih [3], the Laravel framework was used in application development. In addition, research conducted by Pertiwi [4] and Pratiwi [5], shows that the relationship between student organizations and students is important in creating leadership and learning motivation on student achievement.

In this pandemic, a student associations information system is needed so that students don't need to come to campus to take care of documents related to student associations activities. This information system is used for Real Estimate of Cost, activity reports, evaluation of activities, etc. In order that all business processes in the student association can run even better in this era, especially during the Covid-19 pandemic, universities are required to provide online-based services supported by the readiness of technological devices at the university. With this system, UPN Veteran Jakarta can provide optimal

service to student association and can increase the credibility of UPN Veteran Jakarta itself. In addition, it is expected to minimize errors that occur and manage business processes that exist in each student association. So that the benefits generated later, it is hoped that information on Real Estimate of Cost, submission of activity proposals, accountability reports and annual reports can be managed properly. Besides that, it can also support a paperless culture in the college environment.

Based on that explanations, it can be said that this system is needed to improve the quality of service to student associations so as to facilitate data collection and submission of activities to be carried out by student organizations at UPN Veteran Jakarta. In its development, this system will be developed using the waterfall method. Waterfall has been used by many researchers in the system development process as has been done in research [6], [7], [8], [9] and [10].

II. RESEARCH METHODOLOGY

A. Data Collection

Data collection is the process of systematically collecting and confirming information about variables of interest. Where someone can answer questions about system requirements and discussion about the desired system. The following is an overview of the activities carried out at Universitas Pembangunan Nasional Veteran Jakarta in the data collection process for Student Association Information System development.

a) Observation

In this process, we find out the requirements for student association information system at Universitas Pembangunan Nasional Veteran Jakarta.

b) Interview

In this process, interview carried out to the parties concerned, namely student associations, student association supervisor, vice rector, Financial Division, Public Relation Division and the Division of Academic, Student Affairs, Planning and collaboration. To get information, data, and find out the process flow of the system. Table 1 shows number of correspondence.

Table 1. Correspondence

No	Test Case	Number of Correspondence
1	student associations	30
2	student association supervisor	5
3	vice rector	1
4	Financial Division	2
5	Public Relation Division	2
6	Division of Academic, Student Affairs, Planning and collaboration	2
	Total	**42**

B. System Design

The research method used is the waterfall model methodology which explains the systematic stages because the process flows from beginning to end. Among them are system analysis, system design, implementation, testing and maintenance as shown in Figure 1. The model encompasses the following activities:
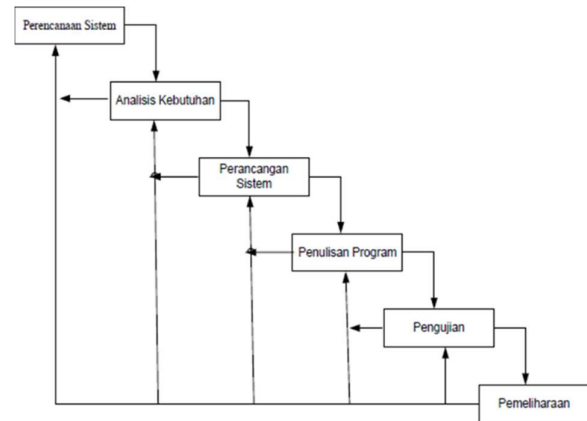

Figure 1. Waterfall Method

a) System Planning

In order to produce quality software, careful planning is needed by conducting a feasibility study. Feasibility studies include: economic, operational, and technical.

b) Requirement analysis

The purpose of system analysis is to determine problems in order to improve the system. So that it is hoped that it can work by analyzing the situation, then the existing problems will be resolved.

c) System Design

The design outlines screen layouts, business rules, process diagrams and other documentation. The results of this stage will describe the new system as a collection of modules or subsystems.

d) Coding/Implementation

In this stage, the implementation of designs and designs that have been carried out. So that at this stage it produces an information system (software).

e) Testing

After the software is built, testing is carried out to test the reliability of the software that has been built. This is done to ensure software reliability.

f) Maintenance

This stage aims to deal with the finished software so that it can function properly and avoid disturbances that cause damage. At this stage, updates can also be made to improve existing software.

C. Use Case

To describe the actors who interact with the system, use case diagrams can be used. The use case diagram is made in accordance with the business processes that have been identified in the system analysis. Functional and operational systems by defining usage scenarios agreed

upon between the user and the developer. The following is the entire SIWA use case at UPN Veteran Jakarta in Figure 2.
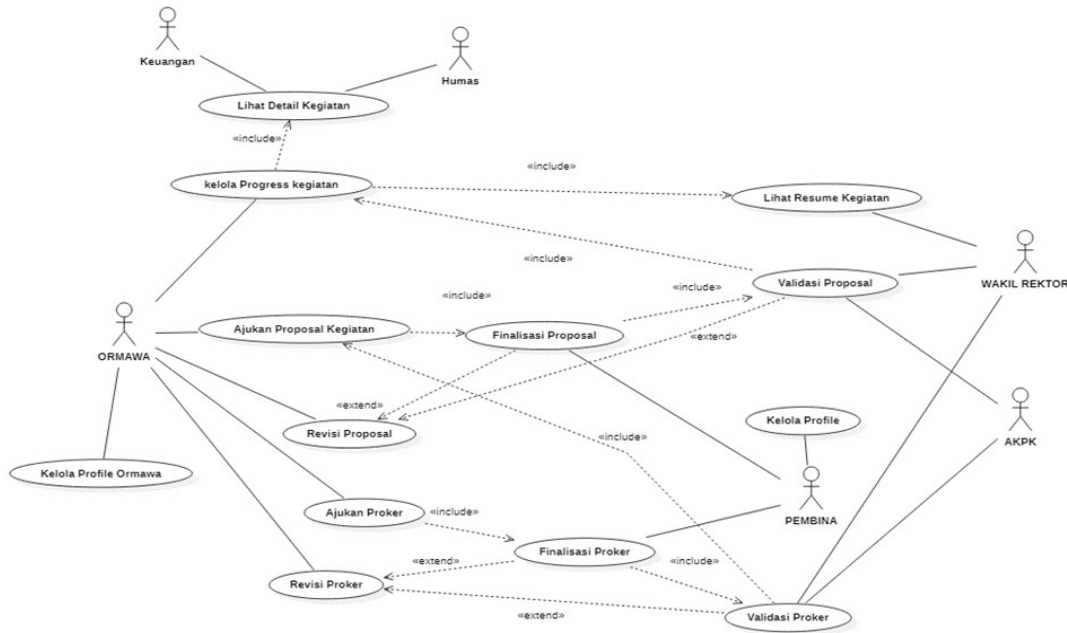

Figure 2. Use Case Diagram

III. RESULTS AND DISCUSSION

The Student Association Information System (SIWA) at UPN Veteran Jakarta has been made and taste as follows:
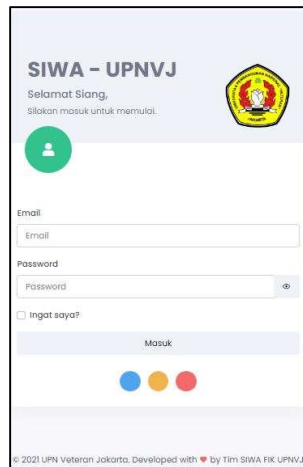

Figure 3. Login

Figure 4. Student Associations Dashboard

Figure 5. Verifier Dashboard

Login page shows in Figure 3. When a user accesses the system, all users will go to the login page and be asked to enter their username and password. After that the user will automatically enter the dashboard page according to the user level.
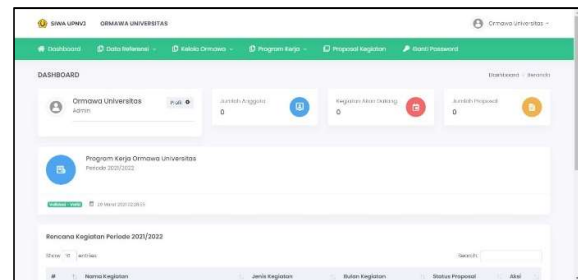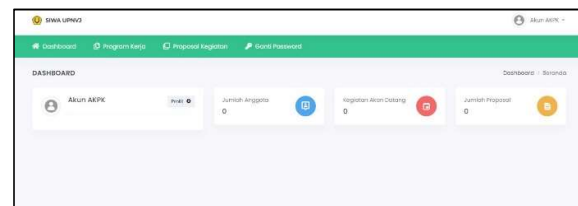
Figure 4 and Figure 5 show the dashboards for the student association level and the Verifier level. On the student associations dashboard, there are several menus including the Work plan menu, activity proposals and activity reports. Furthermore, there is a verifier dashboard which consists of two levels, supervisor level for each student association and the highest level verifier (vice rector and the Division of Academic, Student Affairs, Planning and collaboration) to verify work plan proposal and activity proposal. In Figure 6, Figure 7 and Figure 8 show work plan page, activity proposal page and activity planning list.
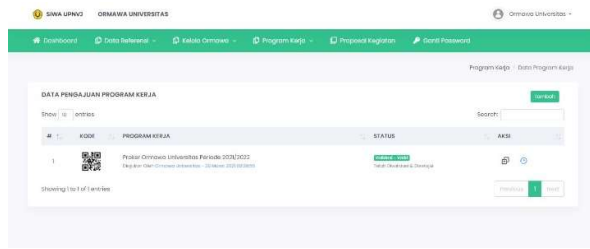
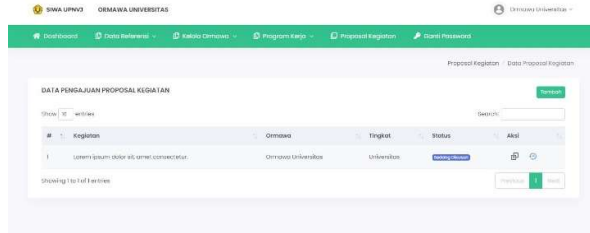**Figure 6.** Work plan Page in Student Association Level

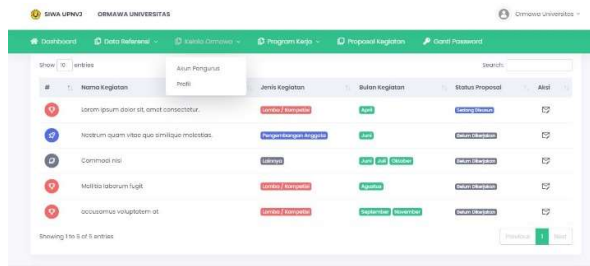**Figure 7**. Activity Proposal Page in Student Association Level

Figure 8. Activity Planning in Student Association Level

On the work plan page there is a list of work plans and we can add, edit and delete work plans. Furthermore, on the activity proposal page we can see a list of activity proposals that have been made and see the status of the proposal whether it has been accepted or not. And we can edit the proposal if there is a revision of verifier. On the dashboard, we can also see a list of activities that will be carried out throughout the annual work plan that has been made.
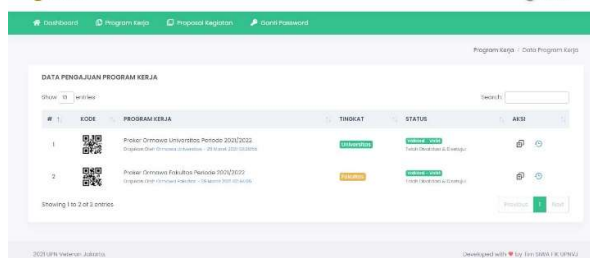

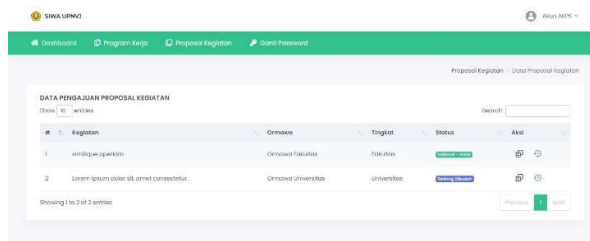**Figure 9**. List of Work Plan Proposal Page in Verifier Level

Figure 10. List of Activity Proposal Page in Verifier Level

Figure 9 and Figure 10 show work plan menu and activity proposal menu in verifier level. On the work plan menu and activity proposal in verifier level, Verifiers can view proposals and make notes for each part of the proposal. In addition, the verifier can provide a conclusion whether the proposal is accepted, revised or rejected.

In the development of this system, black box testing is carried out. Black box testing has been used by many researchers and developers to test a system. The following [11], [12], [13] and [14] are some studies that have been carried out using black box testing. Table 2 shows Black Box testing.

Table 2. Black Box Testing

No	Test Case	Expected Output	Actual Output	Status
1	Check the program of activities recorded in the work planning on the dashboard page	A list of activity programs that correspond to the initial work planning is displayed	A list of activity programs that correspond to the initial work planning is displayed	Pass
2	Click the proposal details in the action column	The system redirects to the proposal detail page	The system redirects to the proposal detail page	Pass
3	Check input with proposal data	Data can be saved by clicking save	Data can be saved by clicking save	Pass
4	Check the input form then click to another menu, then continue input the data	Data is not saved if you do not save first	Data is not saved if you do not save first	Pass
5	Check the input form then click save	The button will only appear if there is already saved data	The button will only appear if there is already saved data	Pass
6	check work planning proposal of student association	Can check the proposal	Can check the proposal	pass
7	Give feedback on the proposal	Can provide feedback on proposals	Can provide feedback on proposals	Pass
8	Click the approve proposal button (finalization)	Can provide proposal finalization status	Can provide proposal finalization status	Pass
9	Click the validation proposal button (validated)	Can provide validation	Can provide validation	pass

IV.   CONCLUSION

Based on the stages taken in the development of the student association information system (SIWA), where the development uses the waterfall method and this system built based on web-based system, it can be concluded that the existence of this information system is able to assist in

organizing documents both proposals, reports, etc. so that it is easily accessible. it can also support a paperless culture in the college environment. In the other hand, Students no longer need to meet directly with their supervisors, especially during the Covid-19 pandemic.

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