Development of The Village Innovation Ambassador Information System With Scrum the Method

Denny Setiawan

Ibn Khaldun University, Bogor, Indonesia.

Corresponding author e-mail: dennysetia1one@gmail.com

Fety Fatimah

Ibn Khaldun University, Bogor, Indonesia

e-mail: fety.fatimah@uika-bogor.ac.id

Dewi Primasari

Ibn Khaldun University, Bogor, Indonesia

e-mail: dewiprimasari@gmail.com

ABSTRACT

Bappedalitbang Bogor Regency while organizing an activity Village Innovation Ambassador need to record all college student from various university with the innovation that they created as the result of this activity. There are problems that Bappedalitbang Bogor Regency faced because the number of college students are plentiful and the data that has been registered is hard to manage as earlier they only use google Forms for recording the data. The purpose of this research is to solve the problems that Bappedalitbang Bogor Regency has by developing a website-based information system to record the data from Village Innovation Ambassador activity which later will be named Neng Dinda. The system that will be developed by the author will be used by Bappedalitbang Bogor Regency with the requirement to record the Village Innovation Ambassador data and then display the data as a distribution map for the college students with their innovation and after that, the college student will be given an e-certificate. This data collection system will be developed with the PHP *framework* Laravel and will develop a method of *Agile Development* with the *Scrum* model. System development is carried out gradually and divided into 4 *sprints.* The result from each *print* is tested using *Black-Box Testaning* with an *Equivalence Partition* model to make sure every function on the system is working as it should be.

Keywords : Village Innovation Ambassador, Laravel, Scrum, Equivalence Partitioning

INTRODUCTION

Bogor Regency Regional Development Planning and Development Agency (Bappedalitbang Bogor Regency) are one of the regional technical institutions within The Bogor District Government. In order to do one of their main jobs, which is to integrate, harmonize and synergize activities from regional institutions, provinces, ministries, people organizations an academy, and private companies, the Bappedalitbang Bogor Regency together with the Bogor District Government make a cooperation with many colleges to put their students as Village Innovation Ambassador to create innovation in the village where they will do the community service program. To support economic growth and competitiveness between regions It's necessary to create innovation. Innovation can be made if the requirements such as well human resources, healthy people, and smart people are available and productive to create innovations in Bogor Regency, therefore Bappedalitbang Bogor Regency make a program Village Innovation Ambassador with the intention of increasing the number of innovations in Bogor Regency[1]. With this program being held, Bappedalitbang Bogor Regency could afford human resources that come from college students. The college students who take part in this program are expected to

blend in with the people community so they could dedicate what they have learned in college to develop the potential of the village where they would do the community service program.

The community service program is an intracurricular activities that gives a chance to students at college to learn how to cooperate with the community[2]. The expected result from this community service program is the creation of innovation in every village in Bogor Regency so this innovation could help to increase community welfare from various fields, like economy, cultrure, academy and other fields that the village has as a potential. After that Bappedalitbang needs to record data on these village's potential based on the innovation that has already been created in every village to plan for future development in every village.

Bappedalitbang Bogor Regency in order to do their task, which is serving information data and monitoring and evaluating regional development then needs to record data from the result of the program Village Innovation Ambassador. But when recording the data, Bappedalitbang faced some problems like the number of college students being so many, so recording the data become difficult. So that to overcome these problems, Bappedalitbang Bogor Regency needs an information system with a database to store the data from the Village Innovation Ambassador program so they can manage and process the data better. With the help of this system information that will be developed for the recording, data would be easier to manage and be processed to give information about the distribution map of innovation from every village, how many innovations have been created, how many student colleges in every village and how many student colleges from each university.

RESEARCH METHODS

The method applied in this research is a development methodology with the Scrum model. Scrum is one of many model development methods from Agile development methodology. Agile methods are incremental development methods in which the increments are small and, typically, new releases of the system are created and made available to customers every two or three weeks. They involve customers in the development process to get rapid feedback on changing requirements. They minimize documentation by using informal communications rather than formal meetings with written documents[3]. Scrum principles are consistent with the agile manifesto and are used to guide development activities within a process that incorporates the following framework activities: requirements, analysis, design, evolution, and delivery[4].
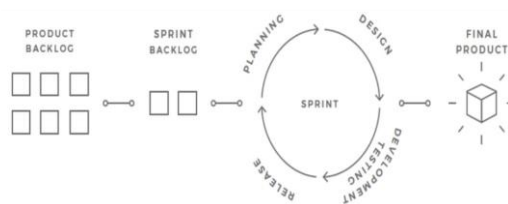

Figure 1. Agile Development Cycle[5]

There are several steps taken in this research, that is:

Collecting Data

Collecting data are being done in three ways:

Interview

Interview conducted with Ibu Riny Kusumawati, S.P., M.M. as head of department Bappedalitbang Bogor Regency on 23 Mei 2022 at her office in Bappedalitbang Bogor Regency. The purpose of doing this interview is to find out the background and the problems that Bappedalitbang Bogor Regency faced when helding the Village Innovation

Ambasador program. From this interview can be concluded that the main problem while Bappedalitbang Bogor Regency helding the program is how they record the data is still using google form. The data later cant be processed much further because the format data from google form is hard to manage.

Document

Document is the data that could support the information that already be gathered from the interview. The document we get after doing the interview are document Activity Frame of Reference from the Village Innovation Ambassador program. With this document we can conclude how we are gonna solve the problem.

Literature Review

Literature review is studying the theories that have correlation with the topic of the research so we could implement this theory to solve the problem in this research which is developing a web-based information system.

System Analysis

System Analysis is being done to find out what is the problem when Bappedalitbang Bogor Regency faced when holding a Village Innovation Ambassador program. From the interview we already gathered information about their problem and then we analyze it to describe what is the root of the problem and the weak point after that, we analyze how to improve and try to solve it in this research.

Analyze The New System. After analyzing the old system, now we analyze how to improve and terminate the problem from the old system. Therefore the system that would be developed will gonna be a web-based system of information that requires a database to store the data. A database is a collection of data that is stored systematically on a computer and could be organized and manipulated with software to produce information. The database is important to avoid duplicated data, confusing relations between data, organizing data, and updating the data[6]. To give a visualization how the developed system running, its shown below at Figures 2.
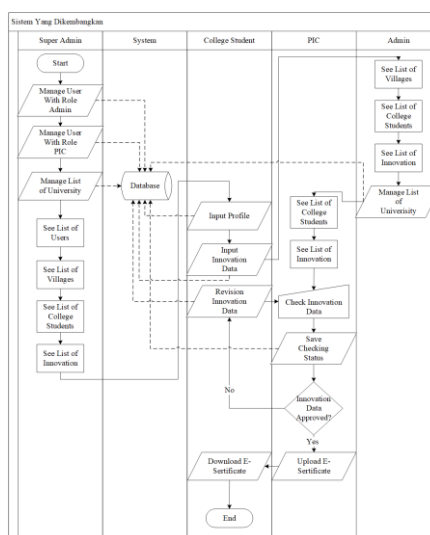

Figure 2. Developed System Process

System Development

To develop the system in this research, we use Agile Development Methods with Scrum Model. This method could provide a success rate higher than the structural method[7]. At

the end of the iteration of the sprint, an increment of functional product is delivered and implemented on the product so the development progress is increasing. With the feature that has been validated at the beginning of development, possibility of the development to be failed is low[5].

System Implementation

System developed with PHP programing language with Laravel framework. PHP is programing language that designed to build web aplication or web page[8]. Laravel is a open-source PHP-web based framework, free and built by Taylor Otwell, and intended to application web development with MVC[9]. The interface of the system builds with the CSS framework which is Bootstrap. Bootstrap is a framework that could help the design process for the interface to become responsive to the user device[10]. The system uses MySQL as database management software. MySQL is a database server program that uses basic SQL commands and is formed as a relational database with two license condition, which is FreeSoftware and ShareWare[11].

RESULTS AND DISCUSSION

Scrum Implementation

Product Backlog

The first step developing system with scrum is to describe the feature or function that will be included and developed into the system. Therefore the product backlog from the system are:

User and Role

Determine the user level and what is the role given for each user. There is four role user on this system, that is : 1) College Student 2) PIC 3) Admin 4) Super Admin. For more details what is the capable of each role is describe at tables 1.

College Student Data Collection

The college student fill their profile data with their serving community program location.

Innovation Data Collection

The college student upload the data of innovation that they already created.

Management University

Admin will organize the data of university who take part in Village Innovation Ambassador program.

Management Innovation

The PIC from Bappedalitbang Bogor Regency will check the data of innovation from college students that under their responsibility.

E-Sertificate

The PIC from Bappedalitbang Bogor Regency will give a E-Sertificate to those college student who already finish the program and upload the innovation data and get approved from PIC.

Management Report

Admin can export data from the system into excel files.

Distribution Map

The system can show the distribution map of student and their innovation.

Table 1. User and Role

Role	Description
College Student	Can set the coordinate of their serving community program location, filling up their profile data, uploading innovation data, updating their profile data.
Admin	Can see college students distribution map, can see the list of college students, see the list of innovation data, add and updating university data. This role given to user from Bappedalitbang Bogor Regency who has permission to look and updating data.
Super Admin	Can see college students distribution map, can see the list of college students, see the list of innovation data, add and updating university data. This role given to user from Bappedalitbang Bogor Regency who has permission to look at and update data and manage all user's role.
PIC	Can see college students distribution map, can see the list of college students under their responsibility, can check innovation data from college students under their responsibility, can upload E-Sertificate. This role given to user from Bappedalitbang Bogor Regency to check innovation data from college students under their responsibility.

Backlog Item

After creating product backlog now we need to create backlog item. Backlog item is a list of more detailed what feature or function need to created to full fill the requirements of product backlog. Backlog item that has been aranged is shown below at tabel 2.

Table 2. Backlog Item

Backlog	Item	Estimated Working Time (Day)
Register College Student and Innovation Data	- registration page - login page - college student data form page - college student edit form page - innovation ambassador form page - innovation ambassador edit page - college students list page - innovation list page - college student dashboard page	30 days
Management college students and innovations	- college students list page - innovations list page - innovations distribution map page - college students distribution map page - list of villages page	30 days
Management	- innovation data checking page	14 days

innovations	-	list of users page	
data and users	-	list of users with role as PIC	
	-	list ofusers with role as Admin	
Management	-	list of university page	14 days
University dan	-	certificate management page	
Sertificate			

Sprints

At the sprint stage, the system development stage begins based on the backlog items that have been made in the product backlog. Then the sprint to be carried out is divided into 4 parts so that each planned backlog item can be immediately realized and evaluated as shown in Tables 3.

Table 3. Sprint Tables

Sprint	Product Backlog	Estimated Working Time (Day)
Sprint 1	Register College Student and Innovation Data	30 Days
Sprint 2	Management college students and innovations	30 Days
Sprint 3	Management innovations data and users	14 Days
Sprint 4	Management University dan Sertificate	14 Days
	Total Days	88 Days

Demo

At the demo stage, a demonstration was conducted on how to use the Neng Dinda system by users who will use the system. At this stage, demonstrations were carried out to students from various universities and from the Bogor Regency Bappedalitbang to be able to evaluate the system that had been created

System Design

System design is carried out to clearly describe how a system will run so that the development process is in accordance with the results of the analysis that has been determined. In designing this system we use modeling such as Context Diagrams, Data Flow Diagrams and Entity Relationship Diagram.

Context Diagram

The context diagram that will be described is an overview of the scope of the system that will run according to the interactions that occur with external parties and also what data is generated from each of these interactions.
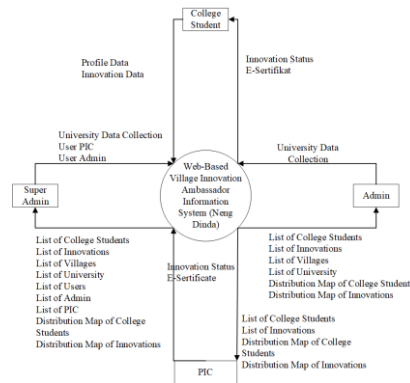
Figure 3 Context Diagram.

Data Flow Diagram

Data Flow Diagrams are used to describe how data or information flows based on input and output provided by each entity that interacts with the system until the data or informations is stored.
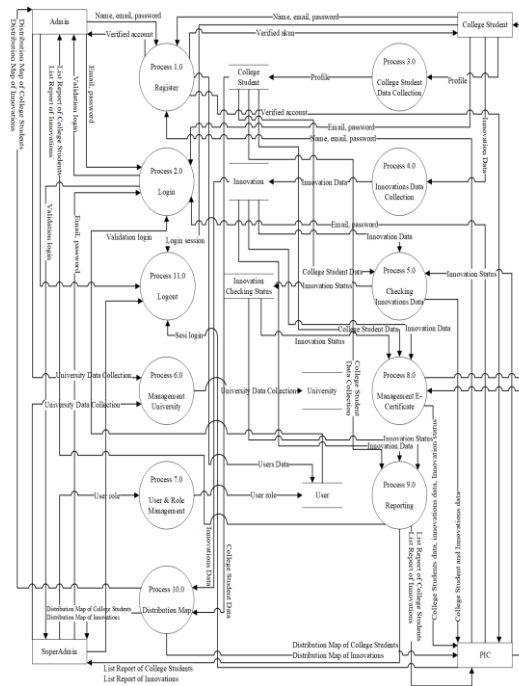

Figure 4. Data Flow Diagram Level 1

Entity Relationship Diagram

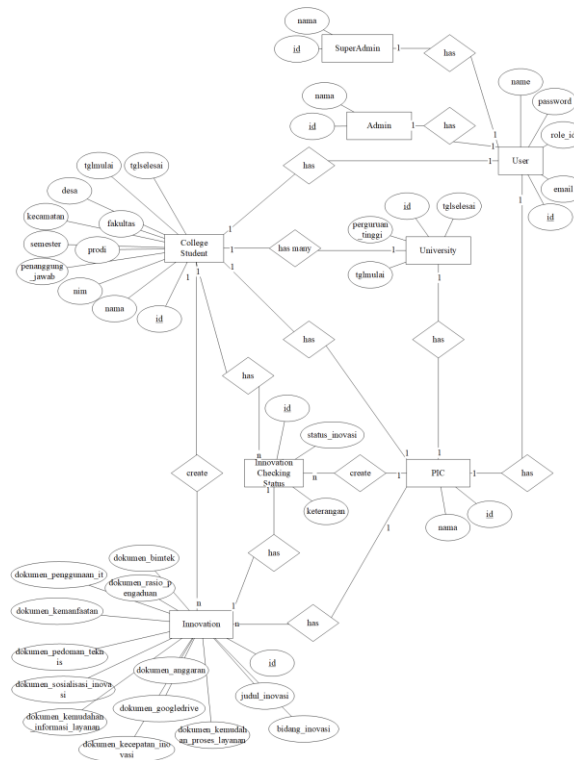Entity Relationship Diagram is used to visualize how each entity of data is related to each other.

Figure 5. Entity Relationship Diagram

Sprint Result

In Scrum, system development is done while doing sprints. The result of this sprint is that a system can be developed based on the design that has been made and has been tested using BlackBox Testing with the Equivalence Partitioning method. The system page display that has been developed is as follows:

Sprint 1

Sprint 1, has created a page that displays a form for college students to fill in with their profile data and where the location of their service community program. And another page is for the college student to upload their innovation data for later will be checked by the PIC from Bappedalitbang Bogor Regency. That page is shown in Figures 6 and Figures 7.

Figure 6. Form College Student's Profile Page

Figure 7. Form Innovation's Data Page

Sprint 2

In sprint 2, as shown in Figures 8 and Figures 8 the display from List of College Student page and List of Innovation page.

Figure 8. List of Innovations Page

Sprint 3

In sprint 3, a page is made to check the innovations made by students and a list of users who have registered on the system. The innovation check page as shown in Figures 9 is a page that will be accessed by the person in charge from Bappedalitbang Bogor Regency to check the innovation data that has been created by their responsible students.

Figure 9. Checking Innovation Data Page

Sprint 4

In sprint 4, a page was made for managing universities and giving e-certificates. On the university management page, where the admin can add data for new universities that have cooperated with the Village Innovation Ambassador program. Furthermore, Figures 10 is the list page of students who have completed the service community program as Village Innovation Ambassadors and will be given an e-certificate by the person in charge of each student

Figure 10. Management E-Certificate Page

CONCLUSION

System development using the agile method with the scrum model can be applied in the development of the Neng Dinda system and has been used by the Bogor Regency Bappedalitbang in collecting data of college students as Village Innovation Ambassadors.

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