Road Work Design and Monitoring
At The Service of Highways and Spatial Planning Central Sulawesi Province

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Abstract - The purpose of this study is to find out what things are needed by PPK and stakeholders so that the design of the system/software that will be developed is in accordance with the needs and development of a monitoring and control system design for the Provincial road improvement project with the wishes/needs of PPK stakeholders at the Department of Highways and Spatial Planning Central Sulawesi Province. The research method used is using the Visual Studio Code (VSC) application to create a programming language. The output of this programming language will be presented in PHP my admin which contains a summary of the progress of the work, including the progress of the work, namely the weight of the plan, the weight of the realization, the deviation of work every month in the period 2016 – 2022.

Keywords: design, monitoring, road improvement projects, work progress, Visual Studio Code (VSC)

I. INTRODUCTION

The development of information technology, especially web-based, can facilitate and greatly assist various fields of work related to facilitating access, distance and time. This advances various construction industries in the use of information technology to monitor project developments, namely using web applications. A web-based project development monitoring information system is a system that can provide information on the development of a company's project online, how much the development of a project that is implemented runs smoothly according to the expected plan (Aprisa and Siti, 2015).

It is undeniable that with the increasing number of projects or jobs coming, of course we are made complicated in prioritizing which projects to work on first, which projects can be delegated to other people or project deadline dates that we ourselves forget. Project Management as a system that can assist in organizing a job is a positive thing for business entities engaged in information technology (Putranto, 2013).

To overcome these problems it is necessary to have a web-based information system. With a web-based information system, companies can obtain information more quickly so that project work can be completed according to project work targets, and it is hoped that this information system can assist in making decisions and supervising the projects being carried out. Based on this background, the authors were inspired to conduct research that entitled "Design and Monitoring of Road Works at the Department of Highways and Spatial Planning of Central Sulawesi Province".

2. LITERATUR REVIEW

2.1 Theoretical Design and Monitoring Framework

2.1.1 Design

Design comes from the Latin, namely: designare which means: to make, form, mark, designate. The definition of design itself in the Oxford Dictionary is a plan or drawing made to show the appearance and function of a building, clothing, or other object before it is actually made.

2.1.2 Design Elements

The design element is the smallest unit that forms the unity of a design. Various design elements include: dots, lines, planes, space, dark and light, shapes, and so on.

2.1.3 Design principles

Design principles or principles are various truths that can be applied to design elements, so that the design looks more beautiful and aesthetically pleasing. The application of design principles includes how we maintain or manipulate: balance, contrast, repetition, color combinations, etc. in the designs we design.

2.1.4   Monitoring Definition

1) Penentuan berkala atau terus menerus dari laju yang ditempati di daerah yang diduduki (pemantauan wilayah) atau yang diterima oleh seseorang (pemantauan personel), 2) Penentuan berkala atau terus menerus dari jumlah radiasi pengion atau kontaminasi radioaktif yang hadir di wilayah pendudukan atau radioaktif yang hadir di wilayah pendudukan., sebagai ukuran keselamatan untuk keperluan perlindungan kesehatan, 3) personel memantau bagian mana pun dari setiap individu, napas, atau ekskresi, atau bagian dari pakaiannya.

2.2   Definisi proyek

 Periodic or continuous determination of the rate occupied in the occupied area (territory monitoring) or received by a person (personnel monitoring), 2) Periodic or continuous determination of the amount of ionizing radiation or radioactive contamination present in the occupied or radioactive territory present in the occupied territory., as a safety measure for health protection purposes, 3) personnel monitor any part of any individual, breath, or excretion, or part of his clothing.

2.3   Road

Law number 34 of 2006 concerning Roads in Architecture (2017) states that roads are land transportation infrastructure which includes all parts of the road, including auxiliary buildings and equipment intended for traffic, which are on the ground surface, above ground level. , below the surface of the ground and/or water, as well as above the surface of the water, except for railroads, lorry roads and cable roads.

2.4   Road Improvement

Road improvement is the repair of damaged roads with the aim of increasing the ability of road structures and facilitating traffic flow. In efforts to repair roads, it can be in the form of improving the structure of road pavement and also widening roads to improve roads. Road improvement is an activity to repair damaged roads until they reach a stable service condition in accordance with the specified design age. This activity is a road handling activity that can improve its structural capability in accordance with the planned age of the road.

2.5   Road Improvement Purposes

The purpose and objective of road repair is road handling in order to improve the ability of the road structure to achieve the planned level of service. In addition, the benefits of road repairs also expedite traffic flow, distribution of goods and services, and play a role in improving the quality of life and human welfare. In upgrading roads and new roads or bridges, they must comply with the principles of sustainable development by ranking green roads.

2.6   Application Used

2.6.1   XAMPP

XAMPP is a computer software package whose naming system is taken from the acronyms Apache, MySQL (formerly) / MariaDB (now), PHP and Perl. While the letter "X" at the beginning of the word comes from the term cross platform as a symbol that this application can run on four different operating systems, such as Linux OS, Windows OS, Mac OS, and Solaris. The XAMPP application program functions as a local server to handle various types of website data that are in the process of being developed. PhpMyAdmin

2.6.2   PhpMyAdmin

PHPMyAdmin is a web-based application that functions to manage MySQL databases or can also be called a database tool. It's really not wrong for anyone to learn it, because this application will be very useful in the development of websites that are currently increasingly popular, for example WordPress which requires access to databases. PHPMyAdmin functions to create, edit, delete databases, tables, and create or delete relationships between tables, sort data, and others according to your needs. When using it, you will get convenience in a more effective way in making databases to web servers.

2.6.3   Localhost

Localhost is the term used to refer to your own computer when you use it as a virtual server. The term localhost is used because these advanced users usually use their computer as a server to perform various work-related tasks. This server can only be accessed on a computer locally or offline, and cannot be accessed by other computers.

3.   Research Methodology

3.1   Data used

The data used is secondary data. Data in the form of project information, sources of funds, types of reports either from service users or from consultants and contractors, implementation schedules and physical progress, payment terms and information on

people with an interest in the project. To support this data, studies are needed from literature, library research, previous research, web applications, along with the software used in this research such as PHP, MySQL database, jQuery and Ajax, as well as several software templates that are widely available on the internet.

3.2   Needs Analysis Stage

At this stage, an analysis is carried out of the problems faced by the project manager (owner/PPK) in terms of ease, accuracy and speed in terms of supervision and access to information on ongoing projects. (a) User Requirements. In the user needs identification stage, initial data collection has been carried out by approaching and consulting users of the website. (b) User Needs. From this stage, User Data (User Level) and User Requirements can be obtained. (c) Information Requirements in the form of Reports. From this report, a summary can also be obtained containing project performance, the amount of financial absorption, problems and solutions, etc. (d) Document Management. In this document management, we can store all kinds of documents, both hardcopy documents that have been scanned and in direct softcopy form.

4.   Results and Discussion of the 2020 Road Improvement Project for Toli –
         Toli Regency and Buol Regency

4.1   Project Identity

This research was carried out on road improvement project activities in the Toli - Toli Regency area. The name of the work on this project is Road Structure Improvement (Lapen -AC.WC) Bilo Tambun Road Section (Bts Toli - Toli Regency) (Regular DAK/DAKF) The contract number for this project is 622/249/SP-Dis.BMPR. The initial contract date is March 16 2020 and SPMK is March 16 2019 with a contract value of IDR 24,983,234,000. The contractor in this project is PT. Wahana Cipta Lestari. The implementation period for this project is 180 days. Activities in this project include (1) preparatory work, (2) drainage work, (3) earthwork, (4) granular work, (5) asphalt work, (6) structural work, (7) restoration of condition and minor work, (8) daily work and (10) routine maintenance work.

4.2   Monitoring Website Design

1.   Register page

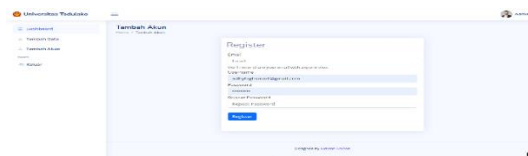This page is used to create user data accounts such as PPK or admin.

Figure 1. Register page

a.   Login Page

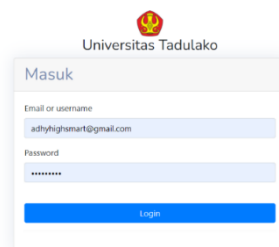This page is used to log in to the website

Figure 2. Log in page

b.   Project Identity Page

This page contains the project identity, namely the name of the activity, name of the work and contractor
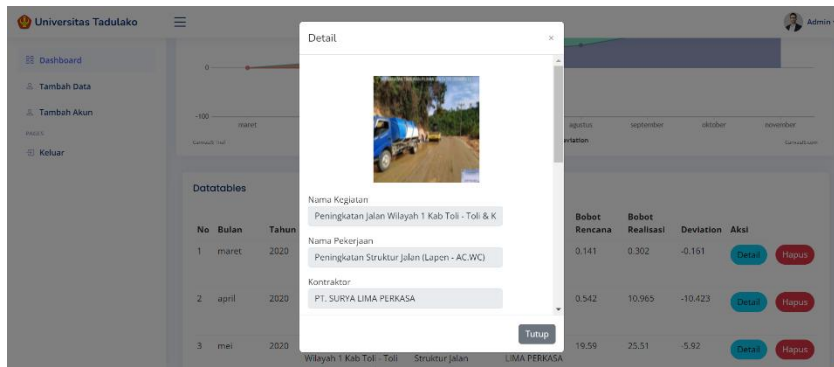

Figure 3. Project Identity Page

c. Project Information System page before logging in

This website can be accessed transparently before logging in.

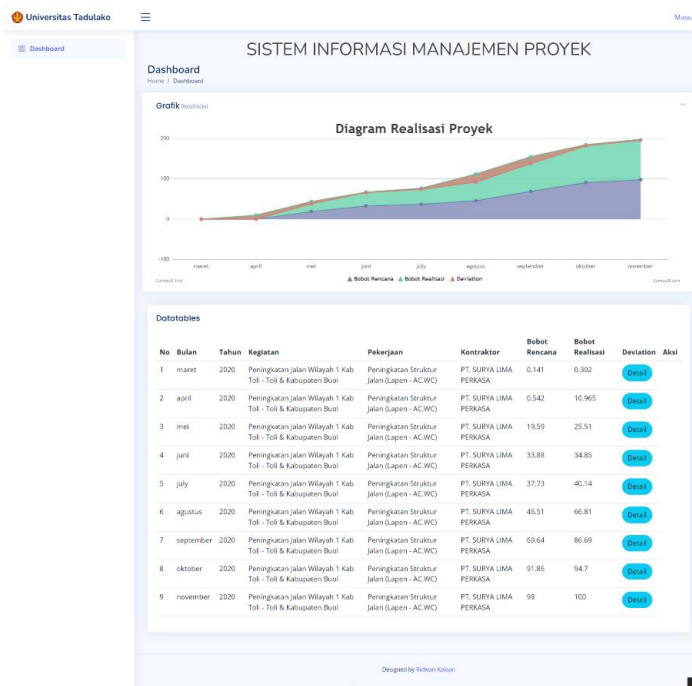
Figure 4. Project Information System before logging in

d. Project Information System page before logging in.

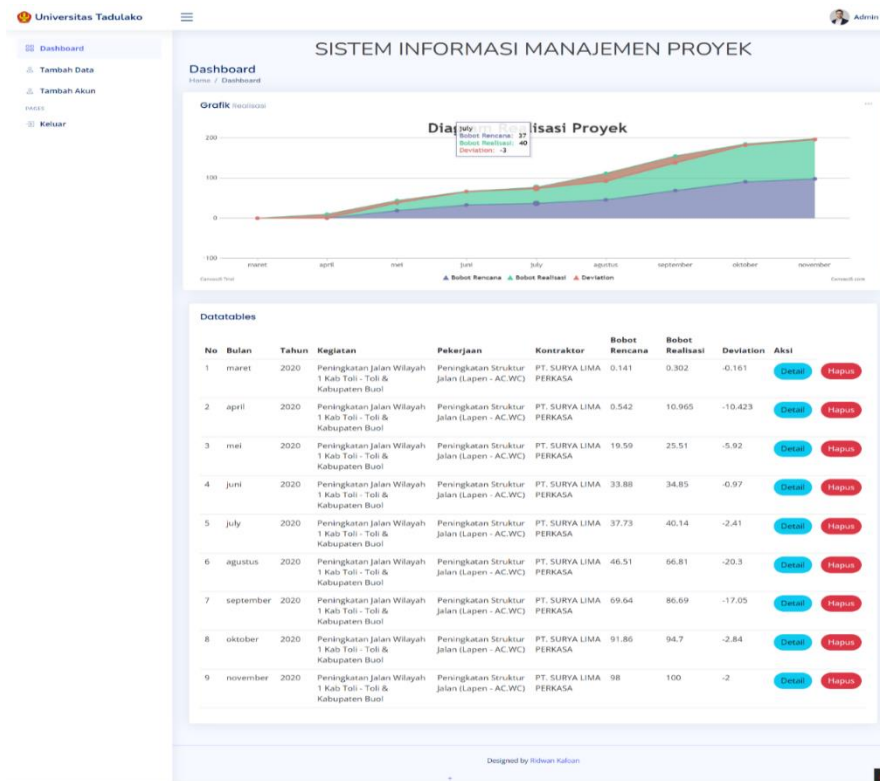On this page, in the diagram you can see the weight of plans, realizations and deviations.

Figure 5. Project Information System before logging in

5. CONCLUSION

5.1 Conclusion

After conducting research at the Department of Highways and Spatial Planning of Central Sulawesi Province, the author can draw the following conclusions:

1. The things needed by PPK and stakeholders in this application are the progress of work every month in the 2016 - 2020 period in the form of plan weights, realization weights and deviations.
2. Developing a monitoring and control system design for the Provincial road improvement project with the wishes/needs of PPK stakeholders at the Central Sulawesi Provincial Highways and Spatial Planning Service can make it easier for PPK to evaluate critical work so that the project can be accelerated when the minus deviation is too low.

5.2 Suggestions

The following are the author's suggestions for further design and monitoring of road work in the Central Sulawesi province's regional development and spatial planning services, namely:

1. It is recommended that further development, Design and Monitoring of Road Improvement Projects at the Central Sulawesi Province Highways and Spatial Planning Service be hosted and become part of the department's official website.
2. For further development, it is hoped that there will be more menu options, transparency regarding the budget used and documentation of activities so that they can be displayed on the website.