

Web-Based Presence Application Development at Pontianak State Polytechnic

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Abstract –The employees' presence is an important factor for an institution, which is relate to discipline and has an impact on the employee's performance. Therefore, it is necessary to have specific data collection to record presence, absenteeism, and work activities that has done every day so that employee performance record in real-time and proper. There are many ways that can be done to achieve a good presence information system, one of them is using computer and mobile phone technology which is implemented with a website-based presence application. At the Pontianak State Polytechnic, finger print machine used in the presence process system, but it is still lack in efficiency and effectiveness in data collection, data retrieval as well as data recap calculations, which require a relatively long time. Besides, the bigger risk of error and loss of presence data. Based on problems, a Web-Based Presence Application Development Information System created at the Pontianak State Polytechnic. The research method used in data collection, which includes research methods, interviews and literature. While software development uses a waterfall model which includes requirements analysis, design, coding, testing and implementation. This web-based presence application can provide convenience in the employee presence process, data search and presence recap calculations, and minimize loss and errors in recording employee presence data. Based on web-based presence application testing and evaluation to thirty-four employees of Pontianak State Polytechnic, it stated that the web-based presence application is suitable for used by all employees of Pontianak State Polytechnic.

Keywords: Information Systems, Web, Presence, Water fall Model, Pontianak State Polytechnic.

I. INTRODUCTION

Pontianak State Polytechnic is an educational institution that has responsibility for services and administration in education. Based on information from the Personnel Department, the number of employees at the Pontianak State Polytechnic currently has more than 500 active employees. The bigger institution, the greater impact on the Human Resources (HR) needed. Based on it, educational institutions are required to perform good, fast, effective and efficient management of presence data processing. The presence information system used as a measure of discipline and the performance of each employee.

Based on the Personnel Department information that the presence procedure at the Pontianak State Polytechnic

that is currently being implemented can be said to be still inefficient and effective, where everything is still done manually starting from data collection and calculation of attendance hours, hours out, overtime, absence and daily activity logbooks. It has an impact on the relatively long time in the process of calculating the presence of employees, as well as the form of attendance reports made in the form of hardcopy which can cause errors in data recording, complicate the data search process and there can be a concern that loss of employee attendance data occurs.

To overcome this, it is necessary to have a web-based presence system that connected to the campus server computer. To access the presence of the web, you can use the network outside the campus, especially for attendance, entry and exit only done if it connects to the local campus area network so that employees must come to campus to do presence. With this application, it hoped to minimize the presence problems that exist in the Pontianak State Polytechnic Personnel Department.

II. METHODOLOGY

A. Waterfall Model [1]

This system development method uses the waterfall method. The waterfall method is a software development process that is sequentially, where the progress or development is like a downward flowing waterfall. In its development, the waterfall method has several stages and the sequence is serial which describes a systematic approach starting from communication, planning, modeling, construction and deployment, as shown in the figure 1 [1].

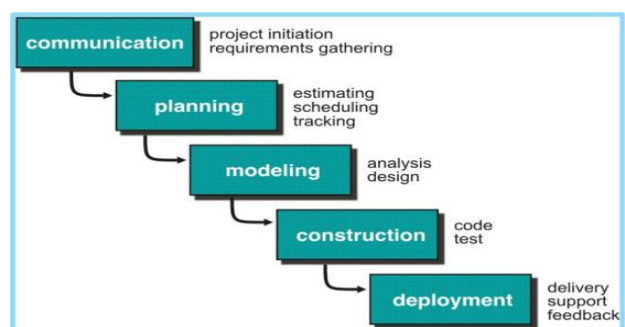


Figure 1. Waterfall method

1. *Communication (Project Initiation and Requirement Gathering).*

Before doing technical work, the early stage is to communicate with the Pontianak State Polytechnic Personnel Department in order to understand the flow of the system and the feature requirements needed to support the making of attendance applications, as well as collect data of all employees who work in the Pontianak State Polytechnic environment. Based on the results of discussions, the process of data collection and presence calculation at the Pontianak State Polytechnic is almost inefficient and ineffective, where the recapitulation is manually. It has a relatively long-time process of calculating employee presence recapitulation. Moreover, the reports still use hardcopy so there is a concern of presence data loss.

2. *Planning (estimating, scheduling, Tracking).* [2]

Making this application begins by determining a situation analysis at the Pontianak State Polytechnic, determining user needs, namely the Personnel Department as managers, and employees as presence users. Then, analyzing the data processing process to comply with the applicable regulations at the Ministry of Technology Research and Higher Education, which implemented in the process of making reports and calculating employee performance.

3. *Modeling (Analysis and Design)* [3][4][5][6]

This stage is the planning and modeling stage of a system architecture that focuses on designing data structures, software architecture, interface displays, and programming algorithms. The goal is to understand the big picture of what will be do and can describe with a context diagram as shown in Figure 2.

In making interface design, using balsamiq to help determine the components needed in the application and layout.

This application is made web-based using Codeigniter, which is supported by technology to help create webs, namely HTML, Javascript, Bootstrap, PHP, MYSQL and several other additional libraries.

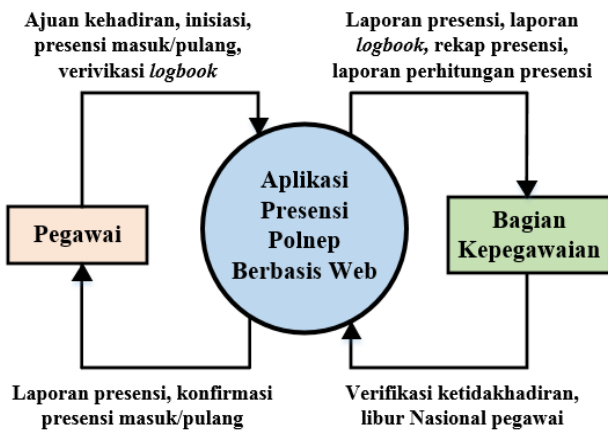


Figure 2. Context Diagram

4. *Construction (Code and Test).* [5][7]

This stage is the process of forming a design using Codeigniter programming code that adjusted to the required data flow and this web application made by carrying an application that is easier to use and an attractive appearance. The process of data flow from web programming code as shown in Figure 3.

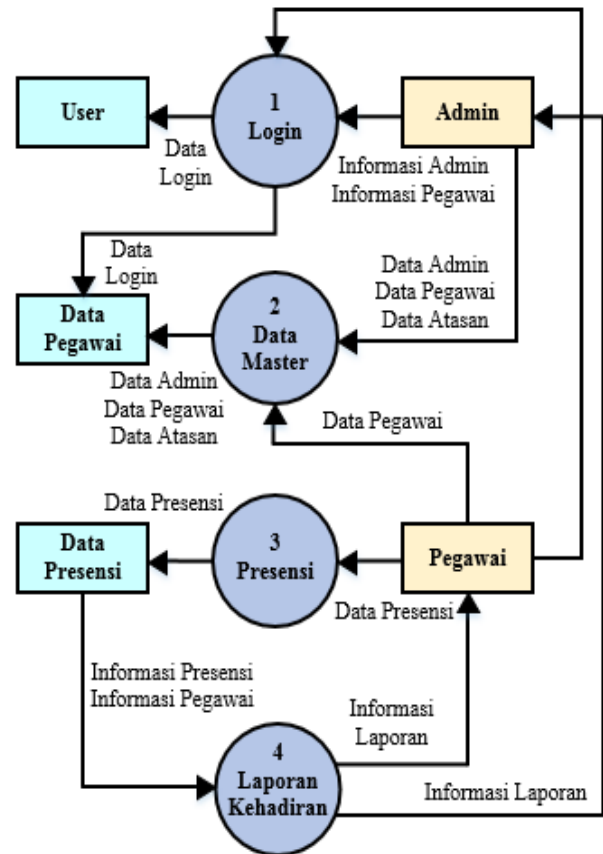


Figure 3. Data Flow Diagram (DFD) Application

From the Data Flow Diagram in Figure 3, the data flow begins with the Personnel Department fill in the employee data and data collection on national holidays. Then the registered employee initiates an identity to get a QR code or link that is unique to each employee. Based on the results of the initiation of employees can perform attendance in and out, filling logbooks and verification of logbooks for the employee's direct supervisor. The Personnel Department verifies applications for employee absence. This web application can be accessed with an internet network, however, especially for entry and exit presence features, it can only be done by accessing the Wi-Fi network in the Pontianak State Polytechnic environment. From several times doing testing and bug fixing to produce a web application that meets the required standards.

5. *Deployment (Delivery, Support, Feedback).* [7][8][9][10]

Deploying the presence application, namely by creating an application on the developer's local computer. Then move the application to a cloud server that uses the

Amazon Web Service provider with a service called EC2. EC2 stands for Elastic Compute Cloud that is a service categorized as Infrastructure as a Service (IaaS) that provides secure and flexible computing capacity in the cloud, starting with registering on AWS, then selecting EC2 services, choose a basic configuration to build a reliable server. It includes the operating system used, namely Ubuntu server 16.04, 2 GB of Random-Access Memory, SSD-based storage media with a capacity of 8 GB, making private and public keys for server security. Next, configure the server network and provide a Public IP so that it accessed from client computers, including opening ports and setting data packets that accepted or rejected by the server. Followed by installing the Apache2 Web Server using the following command:

```
$sudo apt-get install apache2
```

When finished, proceed with installing MariaDB as a Database Management System using the following command:

```
$sudo apt-get install mysql-server
```

After executing the above command, the server will start the MariaDB installation and will ask to enter a password to access the data.

Next, installing PHPmyadmin as a tool for managing data using the following command:

```
$sudo apt-get install phpmyadmin php-mbstring php-gettext
```

Wait until the process is complete, and do a test by trying to access the address [http:// ip public / phpmyadmin /](http://ip public / phpmyadmin/), if a display appears as below then the server is ready to use, as shown in Figure 4. (<http://3.0.162.153/phpmyadmin/>)



Figure 4. PHPmyadmin Login page

Followed by importing the database that created on a local computer that has exported in the form of an SQL file. For the presence application itself, the transfer process uses the ftp protocol using the Winscp application with a mechanism such as copy-paste.

III. RESULTS AND DISCUSSION

A. Application Features

This web-based attendance application is equipped with the following features, namely:

1. QRCode.



Figure 5. QR Code example

This feature is used for employee initiation, its process must be carried out by all employees in order to use this presence application. The user needs to enter the password used for encryption. The output of this process is a QR code that can be used to make presence. Can be seen in Figure 5 (<http://3.0.162.153/presensi/>).

2. In and out presence.

In and out presence can only be done in the campus area by connecting the device (Laptop / Mobile) with the campus area Wi-Fi hotspot network and equipped with a report format for each employee which can only be accessed by the Personnel Department.

a. Presence to go home for lecturers done if the time limit has passed for 2 hours from admission attendance.

b. Presence to go home for other than lecturers done after 16.00 WIB.

3. Logbook.

All Pontianak State Polytechnic employees are required to fill in the logbook before attending home and the logbook accessed outside the campus Wi-Fi hotspot network. This logbook sent to the supervisor directly so it can be verified.

4. Absence

This form used to provide information to the Personnel Department that the employee concerned cannot attend that day such as off-campus official duties, sickness, and permission. This form can be accessed on a network outside the campus.

4. Reports

The reports in this application include daily presence reports, attendance recapitulation reports, logbook reports and presence calculation reports that accessed by users in Personnel Department level.

B. Presence web application pages

1. Login page

Employees at the Pontianak State Polytechnic, both educators and educational staff, can only use the login

page. Contract employees who have employee serial numbers can also do it. The login page display as shown in Figure 6 (<http://3.0.162.153/presensi/>).

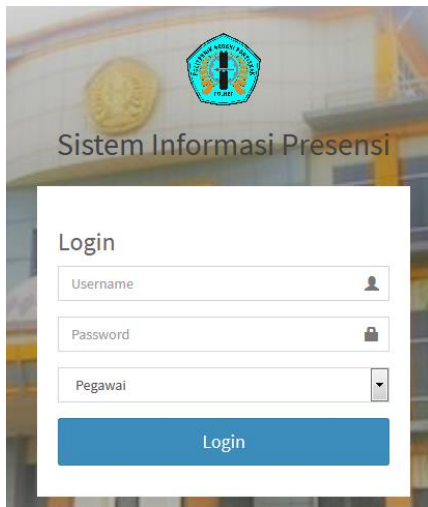


Figure 6. Login page

2. Dashboard page

The dashboard page contains menus and information related to presence. The user level consists of two levels, namely the employee level and the personnel level. For the employee level, it has a menu, namely submission of absence, logbook, logbook verification and settings for creating QR code and password change menu, on the dashboard there are added shortcuts to access the presence menu and logbook. The Personnel Department level has a menu, namely national holiday data collection, employee data collection, absence data collection, and reports which include daily presence reports, daily presence recapitulation reports, logbook reports and presence calculations. The dashboard page display as shown in Figure 7 (<http://3.0.162.153/presensi/>).

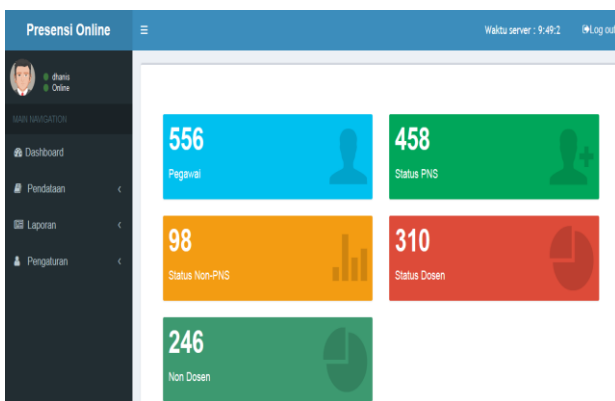


Figure 7. Dashboard user page in Personnel Department

3. Holiday database

This page used for the management of holiday data that applies at Pontianak State Polytechnic. There is an add button to add data, an edit button to make changes, a delete button to delete data, and there is a search form to search for certain holidays. The display of the holiday

database page as shown in Figure 8 (<http://3.0.162.153/presensi/>).

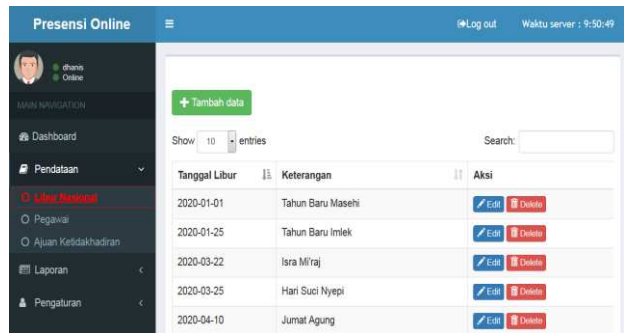


Figure 8. Holiday pages

4. Presence database report

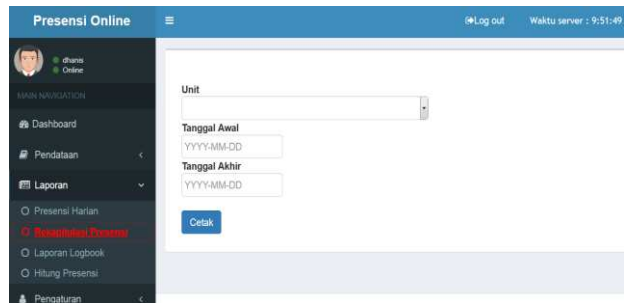


Figure 9. Periodically presence report page

On this page, the users, especially the Personnel Department level, can print attendance data for a certain period by entering the Work Unit, the start date of the period and the end date of the desired period. As shown in Figure 9 (<http://3.0.162.153/presensi/>).

The daily presence report that can be printed-out through this application will display the name of the employee, the date of entry along with the time of entry and time of exit. It will also display holidays, as shown in Figure 10 (<http://3.0.162.153/presensi/>).

Laporan Rekap Kehadiran Pegawai

Periode : 01-08-2020 s.d. 30-08-2020
 Penanggung Jawab : H. Bambang Suswatyono

NO	Nama	NIP	Kehadiran				
			Hari	Tanggal	Jam Masuk	Jam Keluar	Keterangan
			Selasa	01-08-2020	07:47	16:54	
			Rabu	02-08-2020	08:02	16:21	
			Kamis	03-08-2020	08:06	16:40	
			Jumat	04-08-2020	08:03	17:18	
			Sabtu	05-08-2020			
			Minggu	06-08-2020			
			Senin	07-08-2020	08:18	17:02	
			Selasa	08-08-2020	07:39	17:10	
			Rabu	09-08-2020	08:05	17:07	
			Kamis	10-08-2020	08:03	16:35	
			Jumat	11-08-2020	08:13	16:58	

Figure 10. Periodically presence report

5. Presence submission

This page is used for managing employee Presence submissions. This data is filled in by the employee concerned and then verified by the Personnel Department.

Or it can be done by the Personnel Department directly after receiving information from an absent employee. This page can also be accessed outside the campus area. The appearance of the absence submission page as shown in Figure 11 (<http://3.0.162.153/presensi/>).

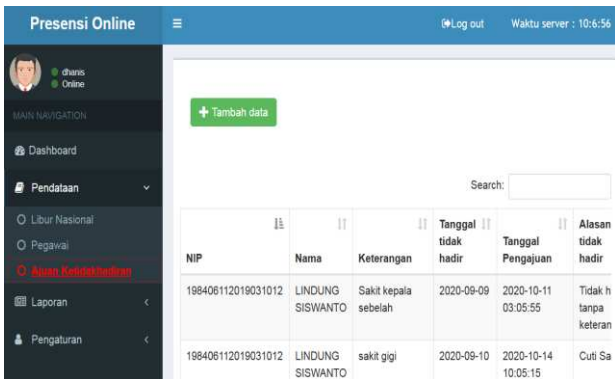


Figure 11. Absence submission page

6. Presence page

The display used to perform presence, in Figure 12 (<http://3.0.162.153/presensi/>) the user's IP address is recognized by the application, and in Figure 13 (<http://3.0.162.153/presensi/>) the IP Address is not recognized by application. The presence button will be active if the IP address used is recognized by the application. Users can go home if they have entered attendance and have previously filled in the logbook of activities carried out on the same day.



Figure 12. Presence page using verified IP



Figure 13. Presence page using unverified IP

C. Web presence application results

In the evaluation stage, the developer distributes questionnaires online using google form to 34 employees

of the Pontianak State Polytechnic consisting of 6 employees of Personnel Department, 15 Lecturers and 13 Administration Staff to get information related to the use of this Presence Application. Following are the results of the questionnaire shown in the pie chart.

1. The effectiveness of the application to help the presence process.

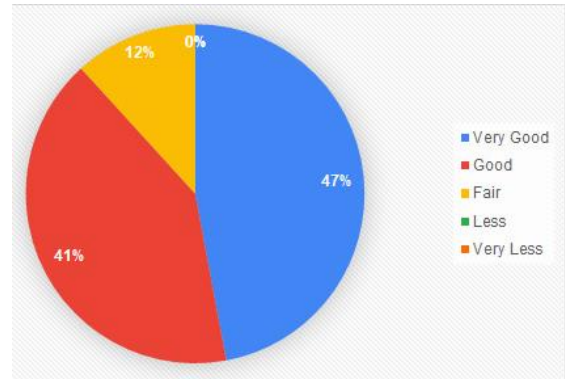


Figure 14. Effectiveness application results

2. Applications help make time, energy and cost efficiency.

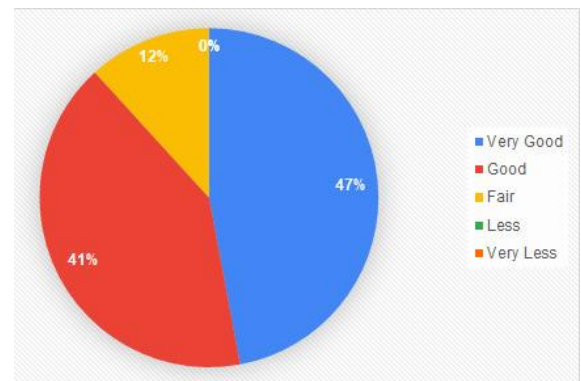


Figure 15. Evaluation Results of Time, Energy and Cost Efficiency

3. Reliable applications in the presence process.

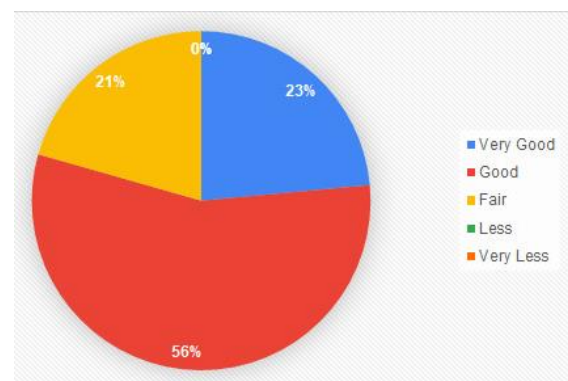


Figure 16. Evaluation Result of Reliable Applications

4. Easy access of applications.

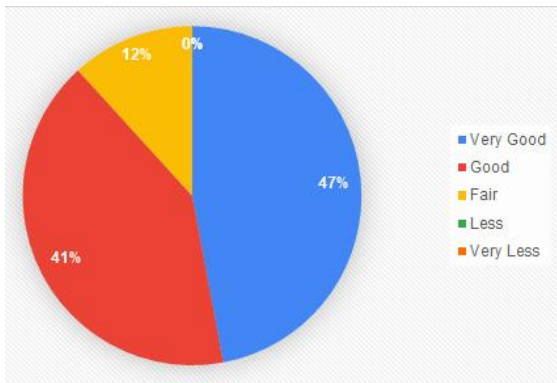


Figure 17. Evaluation Results of Easy Access

5. Easy Use of Applications.

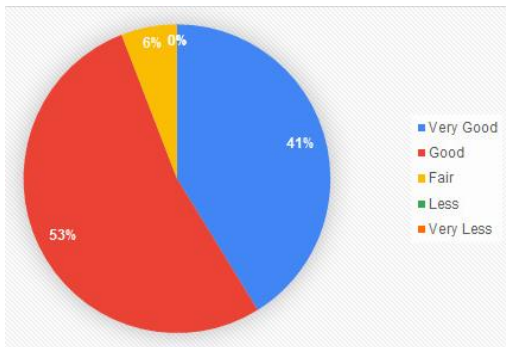


Figure 18. Evaluation Results of Easy Use

6. The speed and accuracy of the information generated by the application.

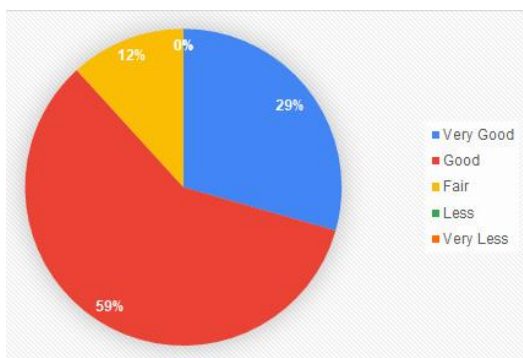


Figure 19. Evaluation Results of Speed and Accuracy

From the responses to the questionnaire for the employee presence Web application, it is in accordance with the data needs desired by the Personnel Department so that the presence Web application is suitable for use by all employees at the Pontianak State Polytechnic.

IV. CONCLUSION

The presence process at the Pontianak State Polytechnic still uses manual recapitulation. It requires a web-based presence information system; this information system is very effective and efficient and fast in recapitulating employee attendance calculations and reports received by the Personnel Department. They can analyze the performance of employees through logbook data of employee activities that directly verified by the supervisor of each Work Unit so that the supervisor can monitor the work performed by his subordinates. The next development of this presence web application will be added features that can calculate the performance allowance for PNS (Civil Servants) in the Pontianak State Polytechnic environment.

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