# Design of a Web-Based Personnel Administration Management Information System at Politeknik Piksi Ganesha

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**Abstract**

The background of this research is that the management of personnel administration at the Piksi Ganesha Polytechnic campus still uses conventional methods, is considered not optimal, and is very prone to viruses and data loss. In this study, the authors used a qualitative research method with a descriptive approach. In contrast, the software development method used was the Prototyping Method using the Unified Modeling Language (UML) system modeling, which was applied using the PHP programming language with the Laravel framework and MYSQL database. This study resulted in a web-based Personnel Administration Management Information System or Personnel Information System (SIMPEG), which has features starting from automatic employee data management, centralized employee filing, and integrated attendance with validation of devices in the campus's Public IP network. It can be accessed on mobile by employees.

**Keywords***: Personnel Information System, Mobile Filing, Integrated Presence*

**Abstrak**

*Penelitian ini dilatarbelakangi karena pengelolaan administrasi kepegawaian yang ada di kampus Politeknik Piksi Ganesha masih menggunakan cara konvesional dan dirasa belum optimal, serta sangat rawan terkena virus dan kehilangan data. Dalam penelitian ini penulis menggunakan metode penelitian kualitatif dengan pendekatan deskriptif, sedangkan metode pengembangan perangkat lunak yang digunakan adalah Metode Prototyping dengan menggunakan sistem pemodelan Unified Modeling Language (UML), yang diaplikasikan menggunakan Bahasa pemrograman PHP dengan framework Laravel dan database MYSQL. Dari hasil penelitian ini menghasilkan Sistem Informasi Tata Kelola Administrasi Kepegawaian atau Sistem Informasi Kepegawaian (SIMPEG) berbasis web, yang memiliki fitur dari mulai pengelolaan data pegawai secara otomatis, pemberkasan pegawai tersentralisai dan presensi kehadiran terintegrasi dengan validasi device berada dalam jaringan IP Public milik kampus yang dapat diakses secara mobile oleh karyawan.*

*Kata-kata kunci: Sistem Informasi Kepegawaian, Pemberkasan Mobile, Presensi Terintegrasi*

## 1. Introduction

Information technology is computer technology (software and hardware) that can manage information more quickly and efficiently to help human needs [1]. At this time, information technology has developed rapidly, and its benefits we have felt today. The various conveniences include the ease of obtaining information through cellular phones and the internet due to the rapid development of information technology [2]. One of them is the internet or the web or often also called web-based software which today has developed very much as a static site and has now developed much into more dynamic and interactive use in information systems [3]. An information system is a unity of elements that are interrelated with each other to become a single entity to combine data [4].

Staffing is all activities related to personnel administration governance. In line with this explanation, staffing is any perspective on managing employee levels, rights, obligations, and maintenance [5]. The leadership of personnel administration, especially at the Piksi Ganesha Polytechnic campus, still needs to be carried out manually and it is not optimal in its implementation because it is prone to viruses and data lo and often makes it challenging to collect files. It is currently carried out by being billed annually to each employee, as well as the absence of an attendance system that makes it easier for employees.

There is previous research on the Personnel Administration Management System by Rahmawati regarding the Web-Based Personnel Information System at SD Negeri Blimbing 4 Malang, which designs a personnel information system to be able to process employee data collection which includes document storage that can be stored in a database based on the type of document used [6]. Alnas and Santoso conducted the same research regarding the design of an employee information system to make it easier for employees to manage data such as employee data and reports on all activities efficiently processing data because the input data is stored in the information database so that it can be edited and accessed at any time [7].

Departing from the above problems, in this study, the author will design a Personnel Administration Management Information System or Personnel Information System (SIMPEG) which includes various features, including centralized and integrated databases, employee data management is carried out automatically so that it is faster and more effective, employee document filing more centralized and well-documented, as well as an integrated presence feature that can make it easier for employees to make attendance because it can be done mobile. The development carried out prioritizes information management that is more digital and has a

more modern and practical appearance. According to the author's expectations, the purpose of developing a Personnel Information System is to make it easier for users to manage personnel administration and answer all the shortcomings of the pre-existing system.

## 2.    Method

In this study, the author uses a qualitative research method with a descriptive approach, which is research that can be carried out on conditions as it is, which provides the purpose of a deeper understanding of a problem studied by describing and interpreting the object as it is thoroughly with all its difficulties [8] [9]. The data collection techniques used are:

 a.   Observation

Observation is a stage of seeing, observing, and observing as well as documenting activities in a structured manner for a specific purpose [10].

 b.   Interview

The interview is a technique of collecting information that is carried out with question and answer between the author and the phenomenon under scrutiny [11].

At the same time, the software development method that will be used is the Prototyping Method. The prototyping Method is a simple SDLC method.  Prototyping allows interactions or changes to occur during the system creation [1] [12]. The stages of the Prototyping development method are shown in Figure 1.
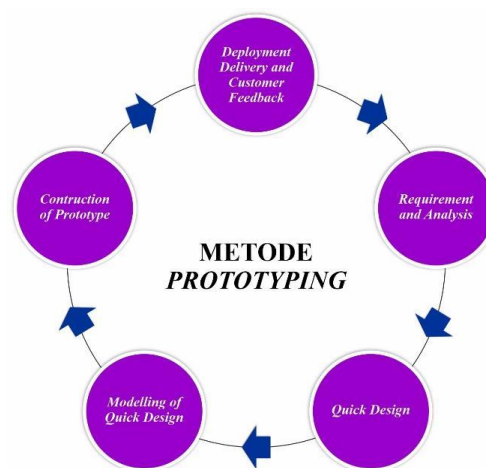


**Figure 1.** Prototyping Method [12]

There are 5 stages in the prototyping method which will be explained as follows:

a.   Requirements and Analysis

The first step is to analyze the system by interacting with problems that are already running and analyzing the system to be designed regarding the required system requirements.

Here the author conducts interviews with the general and HR documents, finance departments, and employees about current staffing governance, then analyzes what problems arise from the system and determines what needs to be designed.

b. Quick Design

The second step is planning thoroughly what will be made from the results of the needs that have been analyzed previously. At this stage, the plan proposed to the campus by the author is to design a web-based Personnel Information System that can be used mobile using the PHP programming language with the Laravel framework and MYSQL database.

c. Modeling of Quick Design

The third step is designing the interface of the system to be designed. In this step, user comfort and convenience are very much considered. At this stage, the interface design of the personnel information system designed by the author includes the employee master data processing feature which contains employee data, class, field, and position; there are also job history, filing, and attendance features.

d. Construction of Prototype

The fourth step is applying the information system design. In this step, the program coding is carried out according to the needs of the system that has been designed. At this stage, the coding of the Personnel Information System is carried out according to the system requirements analysis that has previously been determined.

e. Deployments Delivery and Customer Feedback

The fifth step is testing the system and receiving feedback from the user regarding the system that has been designed, whether it is by the design and easy to use or vice versa. In this step, a simulation of the application of the system is carried out for admins and employees and asked for their responses regarding the system that has been designed.


**3. Results and Discussion**

3.1 Requirements and Analysis

Based on the results of interviews and observations conducted with the General Affairs & HR Section, and Finance Section Staff, it was found that the personnel administration management system was still carried out manually using Microsoft Excel, which was not optimal due to being prone to viruses and data loss, the difficulty of collecting employee files, which is

currently still billed by the General & HR section manually to each employee every year, and no integrated attendance system can be accessed via mobile to make it easier for employees.

This research is the result of an update from previous research found by the author, where the design of a staffing information system that is made only focuses on managing employee data. Hence, the authors design a system that can complement the needs of the staffing system that has existed in previous research. Then a personnel information system was designed to overcome the above problems, namely, a system that has various features, including a centralized and integrated database, employee data management is carried out automatically so that it is faster and more efficient, employee document filing is more centralized and well documented, as well as an integrated presence feature which can make it easier for operators to be present as well as the convenience of each employee who can make mobile presentations.

3.2    Quick Design

The author proposes the design of a Personnel Administration Management Information System or Personnel Information System (SIMPEG) using the PHP programming language with the Laravel framework and the database using MYSQL so that the database is centralized and integrated into one server, a fully automated employee data processing system that makes it easier for operators or admins to managing employee data, there is a centralized employee filing feature, and each employee can upload independently, as well as additional integrated attendance features that make it easier for operators to record employee attendance and make it easier for users or employees to make attendance mobile with validation provisions based on the network on devices that must be in the campus's Public IP network.

3.3    Modeling of Quick Design

To meet the needs of managing and presenting staffing information, the author designed the Personnel Information System interface display at the Piksi Ganesha Polytechnic campus as described below:

a.    Input Design

The author's Personnel Information System input design is explained in **Table 1**.

**Table 1.** Draft Personnel Information System input

| No | NameEnter | Source | Media | Function | Frequency | Actor |
|----|-----------|--------|-------|----------|-----------|-------|
| 1. | Employee Data | Data from the fingerprint presence program system | Personal Computer | Enter employee data | Every time there are new additions or changes to employee data | Admin |
| 2. | Group Data | Financial department | Personal Computer | Include a list of employee groups | Every time there are new additions or data changes | Admin |
| 3. | Field Data | Fields currently on campus | Personal Computer | Enter a list of fields | Every time there are new additions or data changes | Admin |
| 4. | Position Data | Current positions on campus | Personal Computer | Enter a list of fields | Every time there are new additions or data changes | Admin |
| 5. | Position History | Data from the fingerprint presence program system | Personal Computer | Entering the position history of each employee | Every time there are new additions or data changes | Admin |
| 6 | Filing | Each employee who has uploaded files or uploaded them manually | Personal Computer | Enter employee files | Every time there are new additions or data changes | Admin |
| 7. | Presence | Each employee who has done a review | Personal Computer | Record attendance every month | Every month at the time of recording | Admin |
| 8. | Profile | Data for each employee that has been added | Personal Computer or Smartphone | View the personal profile of each employee | Every time there are new additions or data changes | Employee |
| 9. | Documentation (Employees) | *Uploaded manually* | Personal Computer or Smartphone | Employee personal file filing | Every time there are new additions or data changes | Employee |
| 10 | Presence (Employees) | Done manually when making attendance | Personal Computer or Smartphone | Do mobile attendance | Every day when entering and leaving work | Employee |

b.      Output Design

The output design of the author's Personnel Information System is described in **Table 2**.

Table 2. The Draft Output of the Personnel Information System

| No | Output Name | Source | Media | Function | Frequency | Information |
|----|-------------|--------|-------|----------|-----------|-------------|
| 1. | Employee data report | From the data that has been input into the system | PDF or Excel | Know the data of active and non-active employees | Every needed | Admin exports the employee list data report |
| 2. | Group list data report | From the data that has been input into the system | PDF or Excel | Know the current class list data | Every needed | Admin exports group data report |
| 3. | Field list data report | From the data that has been input into the system | Excel | Know the current class list data | Every needed | Admin exports the field list data report |
| 4. | Job list data report | From the data that has been input into the system | Excel | Know the data list of current positions | Every needed | Admin exports the position list data report |
| 5. | Presence data report | From the data that has been input into the system | Excel | Know the attendance data of each employee | Monthly or as needed | Admin exports attendance data reports |

## 3.4 Construction of Prototype

In this step, the author performs coding of the Personnel Information System according to system requirements analysis and chooses 3 UML (Unified Modeling Language) diagram modeling system designs such as Use Case diagrams, Class Diagrams, and Activity Diagrams below.

a.      UseCase Diagrams

Use Case Design Personnel Information System Diagram shown in **Figure 2**.
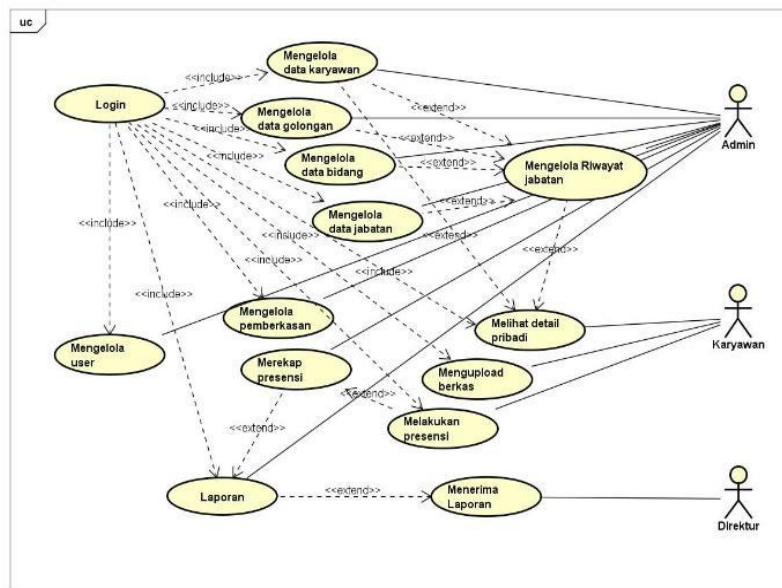
**Figure 2.** Use Case Personnel Information System Diagram

Explanation of the Use Case Diagram of the Personnel Information System is explained in **Table 3**.

**Table 3.** Explanation of the Use Case Diagram of the Personnel Information System

| No | Use Cases | Description |
|---|---|---|
| 1. | Login | It is the process of validating access roles for users who will use them |
| 2. | Manage employee data | It is the process of adding, changing, displaying, and deleting (CRUD) employee data, both old and new employees |
| 3. | Manage class data | It is the process of adding, changing, displaying, and deleting (CRUD) group data. |
| 4. | Manage field data | It is the process of adding, changing, displaying, and deleting (CRUD) data list fields as needed |
| 5. | Manage job data | It is the process of adding, changing, displaying, and deleting (CRUD) position data as needed |
| 6. | Manage Position History | It is the process of adding, changing, displaying, and deleting (CRUD) employee history data |
| 7. | Manage to file | It is the process of adding, changing, displaying, and deleting (CRUD) employee files |
| 8. | Record attendance | It is the process of preparing employee attendance |
| 9. | Report | It is the output process in the form of Excel or pdf, the result of processing the required employee data |
| 10. | Manage users | It is the process of adding or changing user data |
| 11. | View personal details | It is the process of an employee accessing roles to view employee personal details using their respective accounts |
| 12. | Uploading files | It is a process for employees to access roles to upload personal files and other important documents |
| 13. | Do attendance | It is the process of employee access roles to make attendance mobile |
| 14. | Receive reports | It is the director's process of receiving reports that have been processed by the admin |

b.    Class Diagram

The design of the Personnel Information System Class Diagram is shown in **Figure 3**.
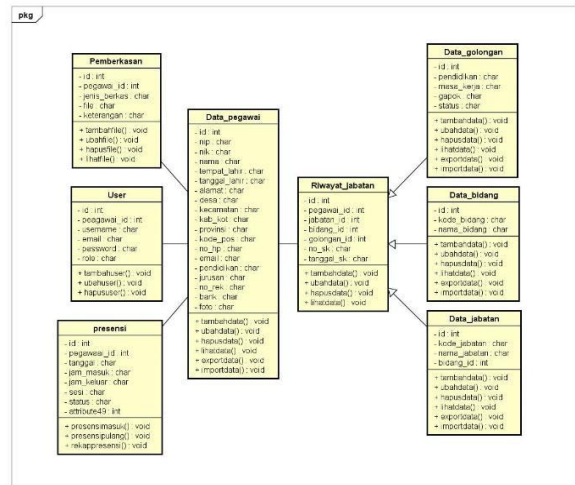


**Figure 3.** Class Diagram of Personnel Information System

c.    Activity Diagram

The design of the Personnel Information System Activity Diagram is shown in **Figure 4**.
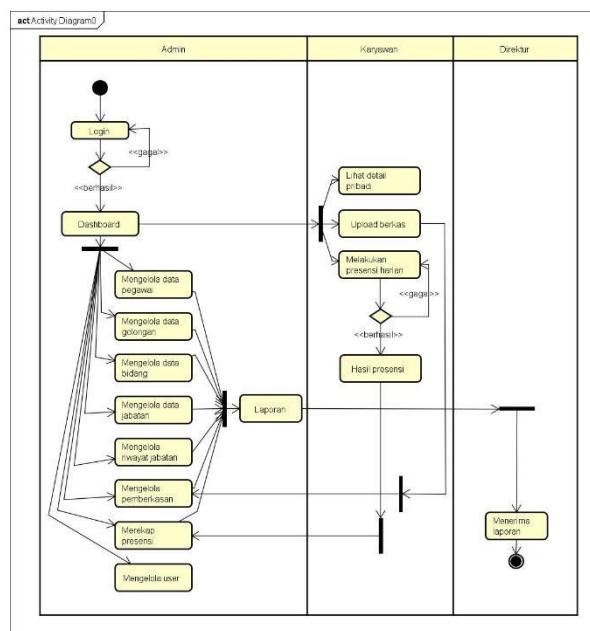


**Figure 4.** Personnel Information System Activity Diagram

3.5 Deployments Delivery and Customer Feedback

Testing The personnel information system application uses black box testing to test application functionality related to application input and output. The application testing results using black box testing are described in **Table 4.**

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**Table 4.** Black Box Testing System Test Results

| No | Test Scenario | Test Items | Actor | Results |
|----|---------------|------------|-------|---------|
| 1. | Login & Register | 1. User login<br>2. User (employee) registration | Admins & Employees | Succeed |
| 2. | Employee Data Management Module | 1. Add employee data<br>2. View employee data<br>3. Changing employee data<br>4. Deleting employee data<br>5. Print employee data report | Admin | Succeed |
| 3. | Group Data Management Module | 1. Add group data<br>2. View class data<br>3. Changing group data<br>4. Delete group data | Admin | Succeed |
| 4. | Field Data Manage module | 1. Add field data<br>2. View field data<br>3. Change field data<br>4. Delete field data | Admin | Succeed |
| 5. | Position Data Management Module | 1. Add job data<br>2. View job data<br>3. Changing job data<br>4. Deleting job data | Admin | Succeed |
| 6. | Position History Management Module | 1. Add job history<br>2. View job history<br>3. Changing job history<br>4. Delete job history | Admin | Succeed |
| 7. | File Management Module | 1. Add employee files<br>2. View employee files<br>3. Changing employee files<br>4. Delete employee files | Admins & Employees | Succeed |
| 8. | Presence Management Module | 1. Record employee attendance<br>2. Set the entry and exit hours of employees | Admin | Succeed |
| 9. | Manage Users & roles module | 1. Adding users<br>2. View users<br>3. Changing users<br>4. Delete users | Admin | Succeed |
| 10. | Profiles Module | 1. View employee personal data | Employee | Succeed |
| 11. | Documentation Module | 1. Add employee personal files<br>2. View employee personal files<br>3. Changing employee personal files<br>4. Deleting employee personal files | Employee | Succeed |
| 12. | Presence Module | 1. Perform attendance | Employee | Succeed |

At this stage, the author simulates and applies the system to operators or admins, and employees who will use the system. Positive responses are obtained because many features make it easier for General & HR Operators to carry out staffing management, including managing employee data which is neat and related to group data, fields, and positions, as well as all-automated employee input to make it easier for operators and minimize errors. Convenience in centralized filing and each employee can upload independently, as well as additional integrated presence features that make it easier for operators to record attendance and make attendance mobile and efficient.

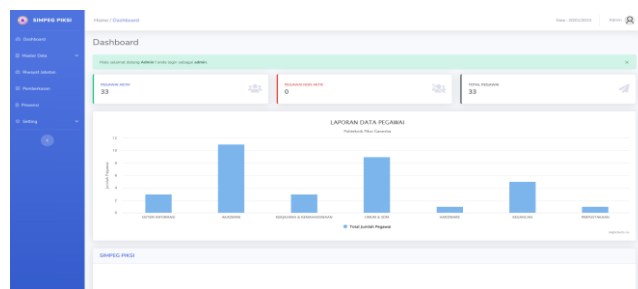a. The Dashboard page view is displayed in **Figure 5.**



**Figure 5.** Dashboard Page

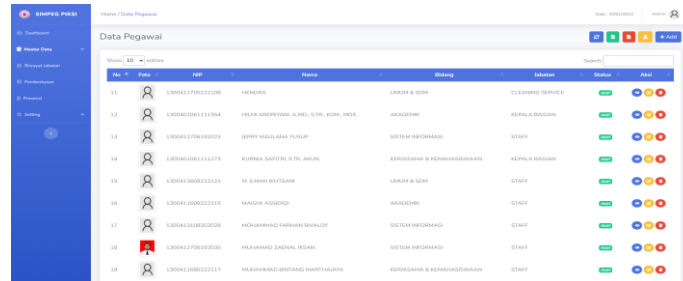b. The Employee Data page view is displayed in **Figure 6.**



**Figure 6**. Employee Data Page

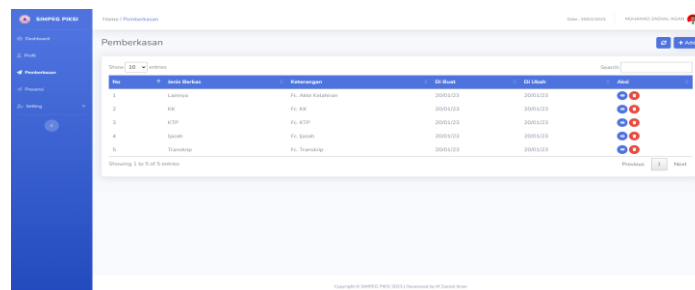c. The Files page view is displayed in **Figure 7.**



**Figure 7.** Filing Page.

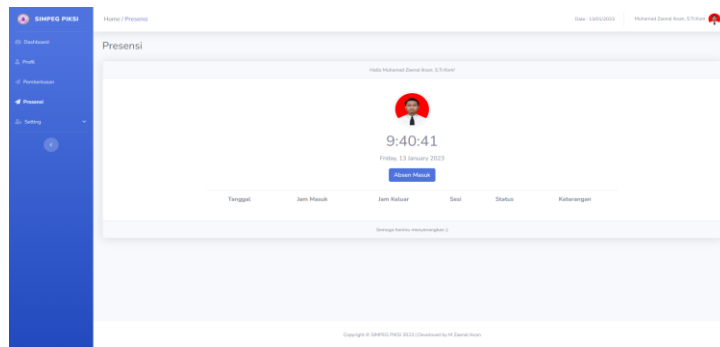d. The Presence page display is displayed in **Figure 8.**

**Figure 8**. Presence Page

e. Display of Employee Data Report in **Figure 9**.



**Figure 9.** Employee Data Report

## 4. Conclusion

Based on the research results from the design that has been made, several conclusions can be drawn as follows:

a. With a centralized and integrated personnel administration governance system in one database, employee data is safer.

b. The fully automated system features allow operators to more quickly and efficiently manage employee data.

c. With the centralized filing system feature, it will be easier to do filing with employees because each employee can upload files independently.

d. With the integrated presence system feature, it will be easier to record attendance and make it easier for each employee because they can make attendance mobile using devices connected to the campus's Public IP network.

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