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# PPH 21 Calculation Application Program For Web-Based Employee Payroll

**Khalimatus Sadiyah[1], Miranti Andhita[2], Oktavia[3], Nanang Suciyono[4]**
*[1,2,3,4] STMIK Mardira Indonesia, Bandung*
*Email: khalimatussadiyah010@gmail.com [1], miranti@stmik-mi.ac.id [2], oktavia@stmik-mi.ac.id[3], nanang@stmik-mi.ac.id[4]*

## Abstract

*STMIK Mardira Indonesia now employs a basic system, Microsoft Excel, to manage staff salaries. However, this system needs more integration with a database for storage purposes. Administrators are concerned about the potential risks associated with manually storing data, including a high likelihood of data loss and other issues, such as miscalculations due to incomplete data entry. Furthermore, the lack of a program to compute Income Tax Article 21 (PPH 21), essential information employees require to comprehend the deductions applied to their earned income, is apparent.*

*This study aims to develop a web-based application for calculating employee payroll, explicitly focusing on PPH 21 calculations. The research methodology utilized in this concluding project is descriptive. The system development method employs the Waterfall approach, incorporating Object-Oriented Analysis and Design (OOAD) for the analysis and design of the proposed system. The system design utilizes a web programming language, specifically the CodeIgniter framework, in conjunction with a MySQL database.*

*The research findings indicate that a web-based employee payroll system using the PPH 21 calculation program has been effectively constructed. This technology is available to employees, making it easier to administer payroll and providing employees with information on the amount of PPH 21 deductions.*

*Suggestions for advancing the web-based employee payroll system, including the PPH 21 calculation tool, involve streamlining the system to improve efficiency.*

**Keywords:** *System, PPH 21, Salary*

**Introduction**

In today's fast-paced information technology landscape, firms must enhance their effectiveness and efficiency in executing operational activities. To accomplish this objective, organizations unquestionably require top-notch human resources to establish efficient administration. Competent personnel can make valuable contributions to the organization's long-term viability, as a corporation must thrive in collaboration. This highlights the significance of employees' function inside the organization, and thus, the corporation is obligated to meet the entitlements of employees, including wage disbursements, benefits, and similar matters.

Companies strive to ensure the rights of employees by avoiding errors in calculations or other concerns that may adversely affect employee performance quality. In addition to their employment, employees are also responsible for fulfilling certain obligations, including paying taxes on their earned income. Article 21, sometimes called PPh 21, explicitly states this provision about "Income Tax."

A deficiency observed in certain firms is the absence of a computerized system, as indicated by the persistent reliance on a basic system such as Microsoft Excel, which needs more integration with a database for storage. This manual storage of data raises issues for administrators. The manual system is vulnerable to potential loss and salary deduction inaccuracies due to inadequate or unstructured data.

Nevertheless, specific organizations have implemented computerized payroll systems, yet some still need a PPh 21 calculating tool. This information is essential for employees to comprehend the magnitude of PPH 21 deductions from their salary.

Given the background information, the researcher created a Final Project called "Implementation of the PPh 21 Calculation Program for Web-Based Employee Payroll at STMIK Mardira Indonesia." This project aims to reduce the likelihood of mistakes in payroll management and offer a PPh 21 calculation program that informs employees about the deductions made for PPh 21.

**Foundation Basis System Information.**

**Definition of the System**

Mahardika & Siregar (2019) , a system is a collection of interconnected and interrelated components.

Damayanti & Jaya (2018) defines a system as a grouping of interrelated components and devices.

Rachman et al., (2020) defines a system as a mental or physical entity composed of interdependent pieces.

**System Requirements**

1. The system must be created to attain specific goals.
2. It is necessary for system elements to possess well-defined strategies.
3. The elements of the system must be interconnected.
4. The essential components of processes, such as the flow of information and materials, are more crucial than the elements of a system.
5. an organization's priorities take precedence over the objectives of individual components.

**Systems' General Model**

A system typically comprises input, process, and output components. The system can have several inputs that undergo processing and generate output based on a specified plan. The subsequent diagram provides a comprehensive depiction of the system.

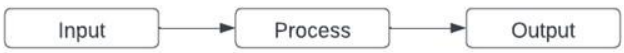


**Figure 1. General System Model**

**System Characteristics**

System characteristics according to (Samuel Mayowa et al., 2022):

1. Components (Components/ Elements)
2. Boundary (System Limits)
3. Environment (Outer Environment System)
4. Interface (System Connector)

5. Input (Input)
6. Output (Output)
7. Process (System Management)
8. Objective and Goal (Targets andSystem Goals)

**Definition of Information**

As stated Wardany et al., (2019), information is the outcome of processing data. However, not all processed data may be considered as information. Data processing outputs that lack significance or usefulness to an individual do not qualify as information for that person.

**Definition of Information Systems**

As Meliana et al., (2014), an information system is a set of interconnected sub-systems that work together to address specific issues by utilizing computer tools to process data, resulting in enhanced value and usefulness for consumers.

**Web Application**

A web application is a software program designed to run on a specific system and aid web users in navigating and utilizing the internet.

Mamluah & Nurdiawan, (2023); Suharyanto et al., (2017) defines a web application as an information system that facilitates user interaction through a web-based interface.

**Waterfalls**

The waterfall approach, initially proposed by Winston Royce in approximately 1970, is commonly regarded as antiquated. However, it remains the predominant software development model in Software Engineering (SE). This development methodology follows a methodical and step-by-step approach. The term "waterfall" describes this phenomenon because of its sequential progression.

Those who have passed must wait for the preceding step to be completed before proceeding sequentially.

The stages of the waterfall method can be seen in the image below:

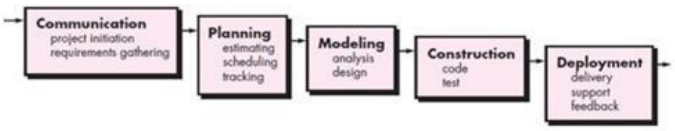


**Figure 2. Stages of the Waterfall Method**

**UML (Unified Modeling Language)**

UML, or Unified Modeling Language, is a linguistic tool used to represent, create visually, and record information about software systems. UML is employed to provide a representation of a system. UML enables the creation of models for various software applications that may be executed on diverse hardware, operating systems, and networks and can be written in any programming language.

Fahlevi et al., (2021)categorizes the categories of UML as follows:

1. Employ Case Diagrams
2. Sequential diagrams
3. Diagram illustrating the sequence of activities
4. Class Diagrams

**MySQL**

MySQL is a relational database management system that facilitates the connection between PHP scripts by utilizing the same query and escape character instructions as PHP. MySQL provides a client interface that facilitates accessing the database by requiring a password for authorization, enabling the execution of various procedures.

**PhpMyadmin**

Somantri et al., (2023) defines phpMyAdmin as a web application developed by phpmyadmin.net that enables the administration and access of MySQL databases.

**XAMPP**

Randy Saputra et al., (2023) state that Xampp is a software application that enables the transformation of a computer into a web server.

**Sublime Text**

In his work, Mahardika & Siregar, (2019) defines Sublime Text as a software tool specifically designed to create and modify apps. Sublime Text offers supplementary plugin functionalities that facilitate tasks for programmers.

**PHP (PHP Hypertext Preprocessor)**

PHP Hypertext Preprocessor (PHP) is a server-side scripting language that is used in conjunction with HTML. PHP is an acronym for Personal Home Page Tools. This script will generate an application that can be seamlessly incorporated into HTML, transforming a static HTML page into a dynamic one. The user's text is incomplete and does not provide any information.

**HTML**

Anhar (2010:40) defines HTML Damayanti & Jaya (2018) as a web programming language with specific syntax or rules for producing scripts or codes. Browsers read these codes to display information.

**CodeIgniter Framework**

Rachman et al., (2020) defines Codeigniter (CI) as a PHP-based application development and program creation framework. The CI framework enables rapid software development by adhering to a pre-established creation framework.

**Basic Basis for Salaries and Taxes**

**Definition of Salary**

As stated by Samuel Mayowa et al., (2022), salary refers to the compensation received for providing services at a managerial level, whereas wages are the payment received for providing services as a worker or laborer. Salaries are generally disbursed every month, whereas wages are remunerated according to the number of days worked, hours worked, or the quantity of units generated.

**Definition of Tax**

Taxes are obligatory payments made by society to the state to fund government initiatives that attempt to enhance the population's well-being. According to Law Number 28 of 2007, tax is an obligatory payment to the government that individuals or entities are legally required to make without receiving direct compensation. The purpose of taxation is to meet the state's needs for the overall welfare of the people.

**Basic Foundations of PPH Article 21**

**Understanding PPH Article 21**

As stated by Mardiasmo (2018:188), income tax article 21 refers to a tax imposed on various forms of income such as salaries, wages, honoraria, allowances, and other payments related to work or position. This tax applies to individuals subject to domestic taxation, as Article 21 of the Income Tax Law specifies.

**Legal Basis for PPH Article 21**

The regulations governing income tax in Indonesia are outlined in Law Number 7 of 1983, which was most recently modified by Law Number 36 of 2008. These laws pertain to the fourth amendment of Law Number 7, specifically addressing income tax. The government has formally adjusted the PPh 21 rate, which will take effect on January 1, 2022. As stipulated in Law Number 7 of 2021 on the Harmonization of Tax Regulations.

## Research Method

### Running System Procedures

The existing mechanism for overseeing employee remuneration at STMIK Mardira Indonesia is outlined as follows:

1. The Personnel Department enters data on allowances, such as SKS, credit allowances for temporary employees, overtime allowances, and health allowances, into Microsoft Excel. The tables, including information on base pay, position allowances, and functional/administrative allowances for employees, are accessible.
2. Once all the necessary data has been entered into the components, the Personnel Department calculates the total salary of employees. Subsequently, a salary report is prepared and submitted to the Head of BAUF.
3. The Head of BAUF reviews the Personnel Section's salary report, which Deputy Chair II further examines. 4. Once the salary report has been received and verified by Deputy Chair II, it is forwarded to the Chair of STMIK for approval. 5. If the Chair of STMIK approves the report, it is handed over to the STMIK Mardira Indonesia Foundation. 6. After all Department Heads and the Foundation have agreed, a salary slip will be issued and given to the employee.

### Use Case Diagrams

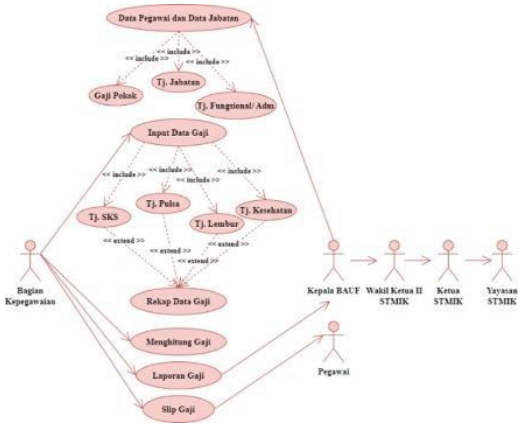


**Figure 3. Use Case Diagram of the Running System**

## Activity Diagrams

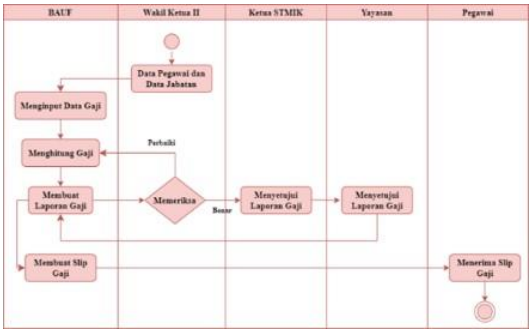


**Figure 4. Activity Diagram of the Running System**

## Sequence Diagrams

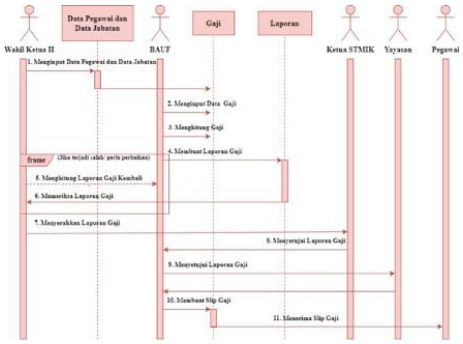


**Figure 5. Sequence Diagram of the Running System**

## SYSTEM PLANNING

Use Case Diagram of Proposed System

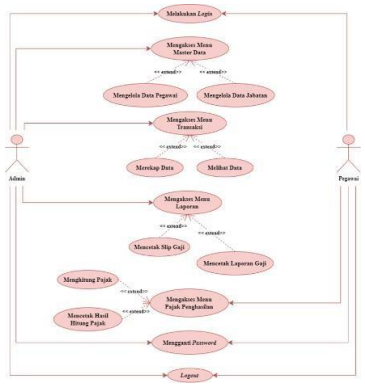


**Figure 6. Use Case Diagram of the Proposed System**

Proposed System Activity Diagram

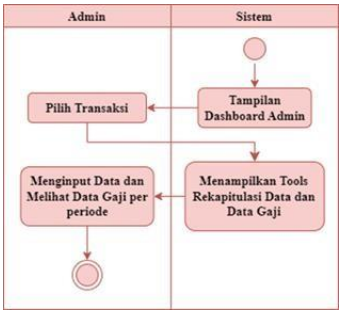


**Figure 7. Activity Diagram Accessing the Transaction Menu**

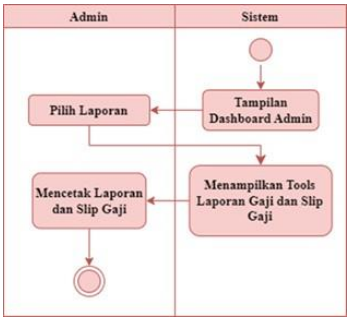


**Figure 8. Activity Diagram Accessing the Report Menu**

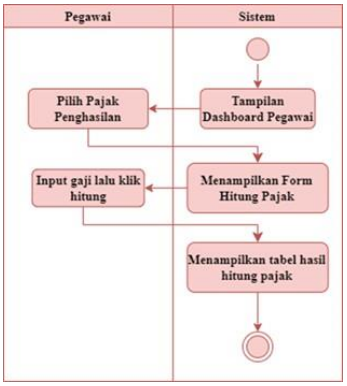


**Figure 9. Activity Diagram Accessing the Income Tax Menu**

## Proposed System Class Diagram

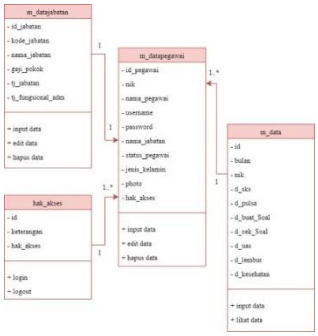


**Figure 10. Class Diagram of the proposed system**

## Sequence Diagram of the Proposed System

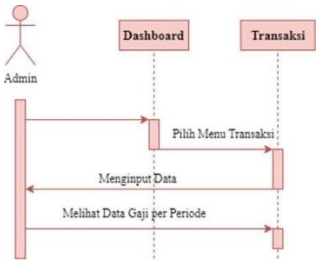


**Figure 11. Sequence Diagram Accessing the Transaction Menu**

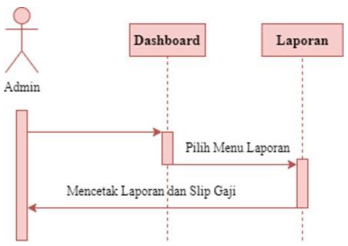


**Figure 12. Sequence Diagram Accessing the Report Menu**

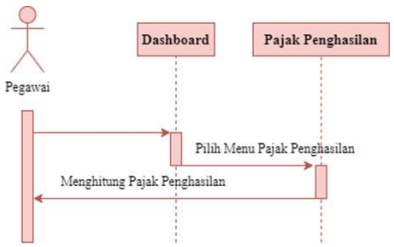


**Figure 13. Sequence Diagram Accessing the Income Tax Menu**

**Database Design**

1. Position Master Data Table
(m_job data)
Primary Key: position_id

**Table 1. Table m_job data**

| *Field* | *Type* | *Size Field* |
|---|---|---|
| position_id | int | 11 |
| position_code | varchar | 5 |
| position_name | varchar | 20 |
| basic salary | varchar | 50 |
| tj_ position | varchar | 50 |
| tj_functional_adm | varchar | 50 |

2. Employee Master Data Table
(m_pegawaidata)
Primary Key: employee_id

**Table 2. Table m_employee data**

| *Field* | *Type* | *Size Field* |
|---|---|---|
| employee_id | int | 11 |
| NIK | int | 11 |
| employee_name | varchar | 50 |
| username | varchar | 10 |
| password | varchar | 32 |
| position_name | varchar | 20 |

| | | |
|---|---|---|
| employee status | varchar | 15 |
| gender | varchar | 10 |
| photo | varchar | 22 |
| access rights | tinyint | 1 |

3. Master Data Table (m_data) Primary Key: id

**Table 3. m_data table**

| *Field* | *Type* | *Size Field* |
|---|---|---|
| id | int | 11 |
| month | varchar | 10 |
| NIK | int | 11 |
| d_sks | int | 11 |
| d_pulsa | int | 11 |
| d_create_question | int | 11 |
| d_check_question | int | 11 |
| d_uas | int | 11 |
| d_overtime | int | 11 |
| d_health | int | 11 |

4. Access Rights Table (access_rights) Primary Key: id

**Table 4. Access_rights table**

| *Field* | *Type* | *Size Field* |
|---|---|---|
| id | int | 11 |
| information | varchar | 10 |
| access rights | int | 11 |

## Interface Design

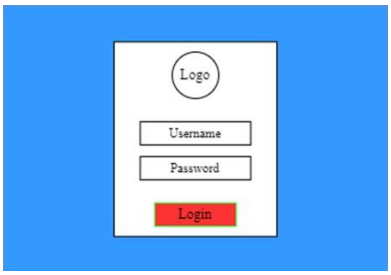


**Figure 14. Login Form Display**


**Figure 15. Admin Dashboard Display**


**Figure 16. Employee Dashboard Display**

## Result and Discussion

### SYSTEM IMPLEMENTATION

The system implementation step involves describing and preparing an application system to ensure its operational readiness. The following figure depicts the system design that has been formulated:


**Figure 17. Implementation of the Login Form Display**

**Figure 18. Implementation of the Admin Dashboard Display**

**Figure 19. Implementation of the Employee Dashboard Display**

## Conclusion

### In conclusion

From the research above and discussion, the following conclusions have been derived:

1. Utilizing MySQL as a substitute for Microsoft Excel in database management is a highly beneficial measure for enhancing data storage and processing effectiveness and safeguarding. MySQL enables users to store data in an organized manner, retrieve it collectively, and perform diverse data manipulation tasks with more efficiency. Furthermore, MySQL offers robust security measures to safeguard confidential information while facilitating seamless integration with other applications.
2. To construct the payroll system application with the PPh 21 calculation software, employ the Waterfall system development approach and the OOAD system design analysis method with UML modeling (Unified Modeling Language).

### Recommendation

According to the research, there is considerable optimism regarding the

potential for further development of this information system to enhance its efficiency.

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