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Payroll System Design using Waterfall Method in Gadingsari Village Owned Enterprises

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Abstract.

This study aims to design a payroll information system for Gadingsari Village Owned Enterprises to reduce errors in the payroll process. The data collection method uses empirical studies with descriptive qualitative and quantitative approaches. While the design method used is the waterfall method by conducting analysis, planning, design, system implementation, experimentation, and system maintenance. The resulting system is a payroll system that can accommodate quite large data such as employee data, benefits, job information, employee's latest education, and employee status. and a more accurate and faster salary calculation. This payroll information system has an employee attendance feature to record outgoing and incoming employee data. shows that this system is easy to navigate, easy to operate, provides sufficient features, precise and accurate salary calculation process, good data storage, and appropriate output. From this system, all payroll processes will be more precise, thorough, and faster than the previous manual system used by Gadingsari village owned enterprises.

INTRODUCTION

The last decade has seen technological developments in accessing consumer products such as salaries using the latest technology (1). The important role of information systems is to change the structure or operations of an organization and institute to achieve their respective goals (2). An efficient payroll information system must have regulation and standardization to remind financial management for an organization (3). In a payroll information system, it must have input and output such as employee data information, employee status, length of work, employee position, basic salary, and benefits provided by a company (4).

The background for the establishment of the Gadingsari village owned enterprises is aimed at improving the village economy in accordance with its mission, namely administratively, financially, in work and in community life, increasing village economic growth through empowering productive economic businesses both groups and individuals and increasing human resources of village government and other elements. elements of quality village institutions, good service, clean, and responsible.

Gadingsari village owned enterprises has several businesses that still using an old system. That's why a payroll system is needed. The rapid development of Gadingsari village owned enterprises has made manual payroll being not effective from an administrative and salary calculation perspective. Apart from being time consuming, there can also be errors in the calculation of salaries. Based on these considerations, Gadingsari village owned enterprises

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decided to build a computer-based payroll system.

Previous research (5) (6) (7) only has a feature to produce salary slips and salary calculations with the design method using the waterfall method. In this study, the system designed has more features such as inputting employee data features, employee attendance features, more complete salary calculations, and producing salary slips that are more comprehensive and accurate. Salary calculations will be much more accurate and faster when using a computerized system and is more secure than the previous system.

On the previous research, there's no function to do employee data management and attendance management on the previous research. That's why on this study, the designed system is implementing more feature to make payroll process more complete.

METHODOLOGY

In this study, the data collection method was carried out using an empirical study that had activities to collect, classify information, and analyze the information obtained for this research (8). With a descriptive qualitative and quantitative research approach with analysis of village owned enterprises employee biodata and information on the payroll process. Interviews are one of the methods used to collect data and information needed to design a payroll information system which was carried out with the secretariat of Gadingsari village partners.

For design, the Waterfall Method is a methodology commonly used to design software with several structured stages such as conducting analysis, planning and design, system implementation, testing, and system maintenance (9) which can be seen in **Figure 1.**

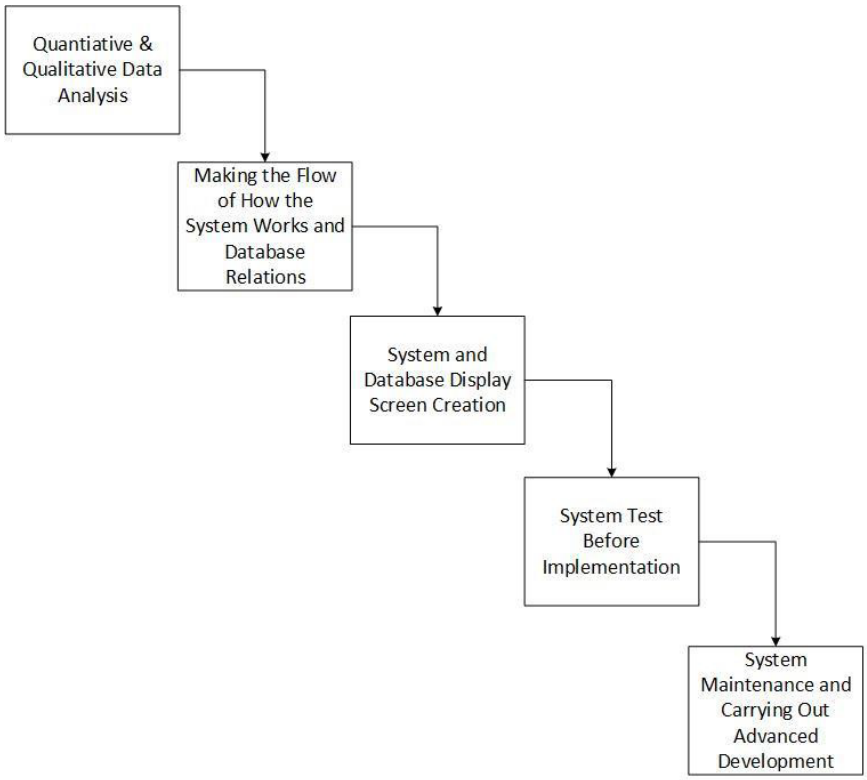

FIGURE 1. Waterfall Method

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The Waterfall method has 5 stages to develop a system as follows:

1. This analysis stage is carried out by analyzing qualitative and quantitative data. And proceed with identifying and formulating all the things that support to achieve the planned goals.
2. The design or design phase is carried out by undergoing the process of identifying the requirements needed to design software before the implementation phase such as making the flow of how the system works and database relations.
3. The implementation stage is where the payroll information system is created which includes the system display screen and the database creation.
4. At the testing stage, a system test is carried out to find out whether a system can run properly before implementing and maintaining the system.
5. At the maintenance stage, system maintenance is carried out to keep a system running smoothly and carry out further development if there are internal or external changes.

RESULT AND DISCUSSION

In designing this system, use-case diagrams are used to identify, explain, and manage the requirements needed to design a system (10). The description of the payroll information system process workflow that will be designed is depicted in **Figure 2.**

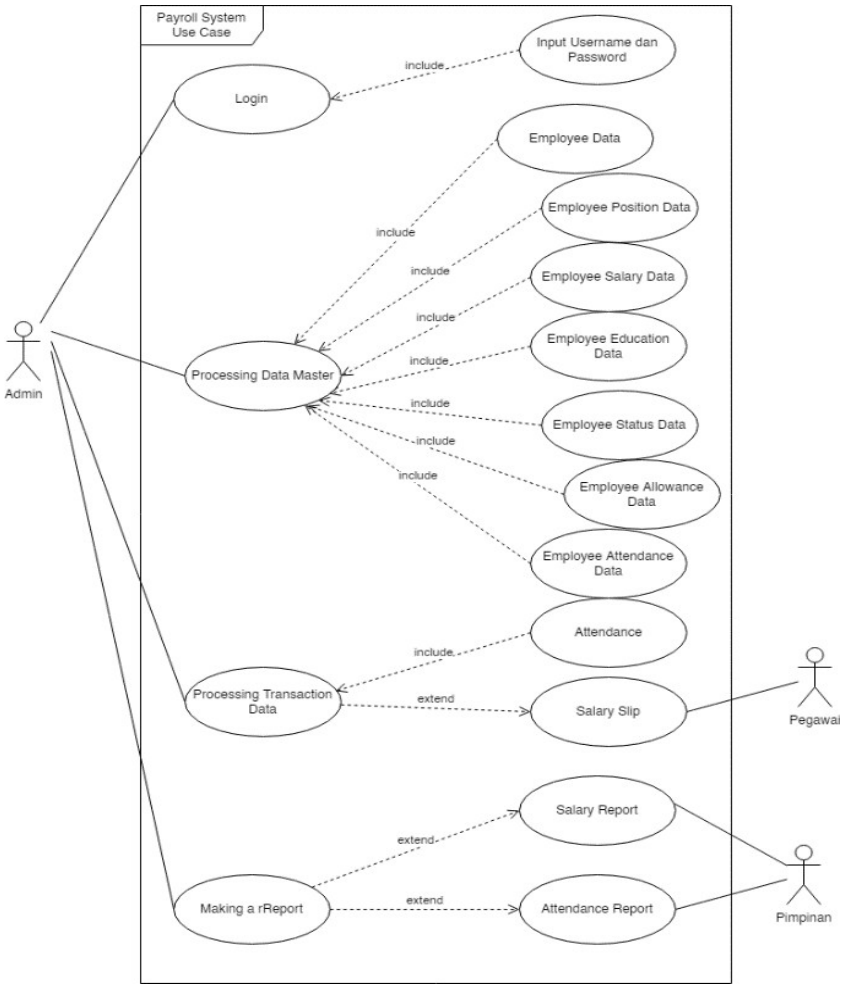

FIGURE 2. Payroll System Use-Case Diagram

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With the use of a database system that is more sophisticated than the previous system because if there are incorrect or inconsistent data, it can create analysis results, conceptual models, and resource models (11). The image of the database layout that will be designed in the payroll information system can be seen in **Figure 3.**

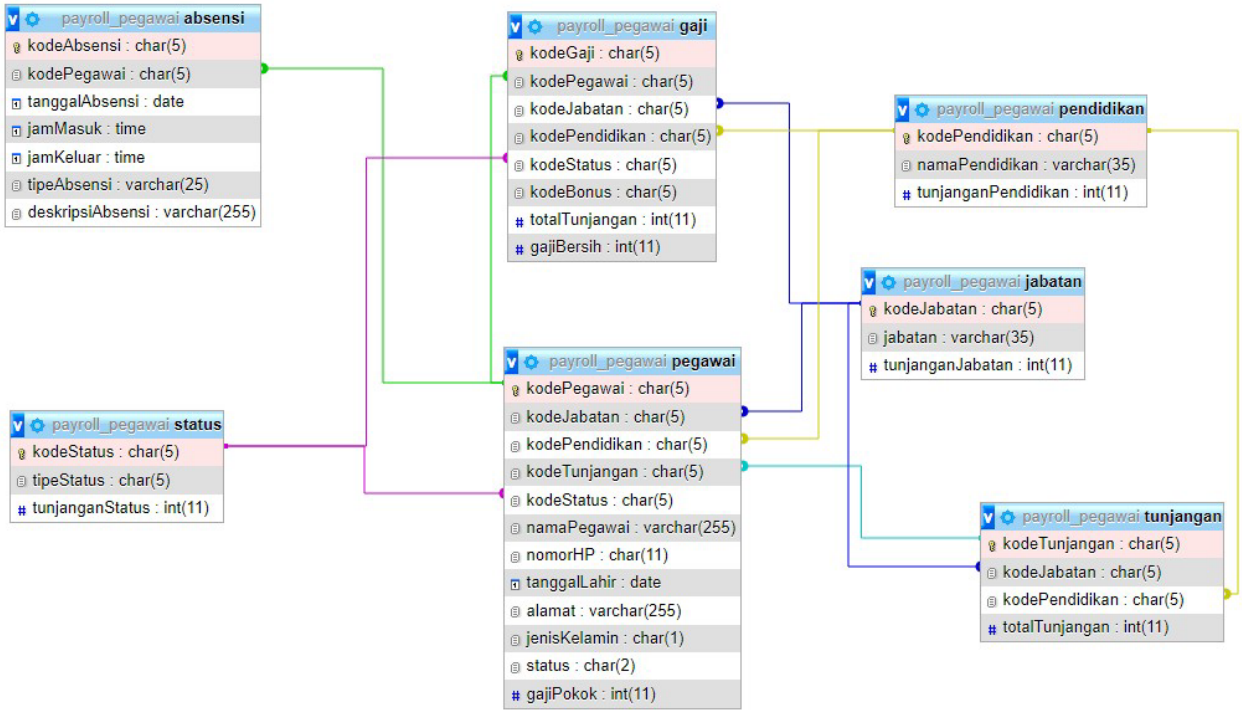

FIGURE 3. Systems Database Layout

Activity Diagrams are usually used to find out the results of several examples of cases that will be carried out on a system that will be designed (12). For payroll information systems that are designed, activity diagrams will be useful for viewing output and correcting some processes if they are not in the desired order. The complete Activity Diagram can be seen in **Figure 4.**

Navigation system menus that are structured and transparent are a guide for users to view information about the features provided by a system and increase user knowledge of the system to be used (13). The menu hierarchy in the payroll information system can be seen in **Figure 5.**

Salary slips that will be generated by this system will be given to employees who receive salaries as proof of salary receipts. This salary slip is given by the admin and will be forwarded to the supervisor and will be forwarded to the Gadingsari village owned enterprises superior then forwarded to the finance party to send the net salary amount. The resulting salary slip can be seen in **Figure 6.**

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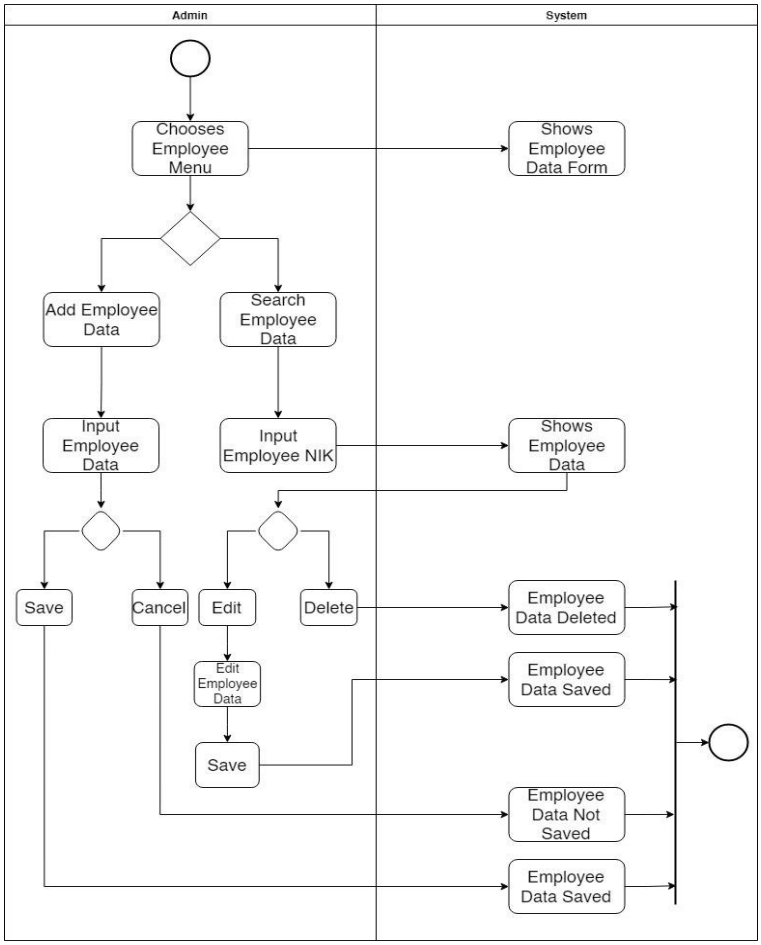

FIGURE 4. Employee Activity Diagram

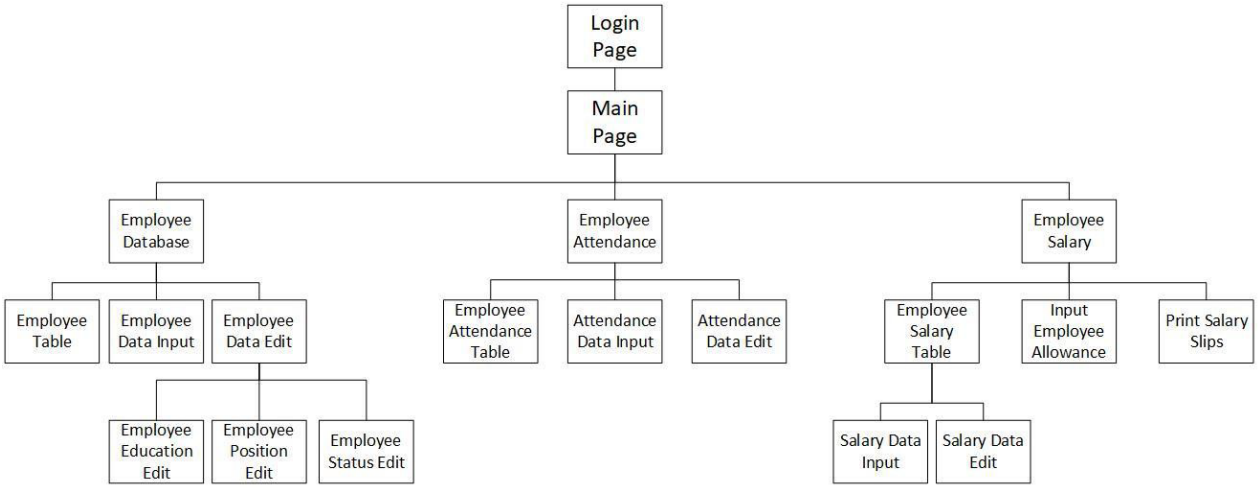

FIGURE 5. Payroll Information System Menu Hierarchy

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BUMDes Gadingsari — SLIP GAJI

Juni 2022

NIK/Nama	: A0001 - Angriawan Yevance Mailoa	Grade	: A+
Jabatan	: Admin	Golongan	: Golongan II
Departemen	: Management	Section	: IT Admin

PENERIMAAN		POTONGAN	
Gaji Pokok	5,000,000	Potongan Cicilan	1,200,000
Uang Makan	900,000	Potongan Telat	100,000
Transport	1,500,000	PPh 21	350,000
Tunjangan	1,000,000		
TOTAL PENERIMAAN	8,400,000	TOTAL POTONGAN	1,650,000

TAKE HOME PAY 6,750,000

Jakarta, 27 Juni 2022

Disetujui Oleh: Diterima oleh:

Ditransfer Ke:
BCA Cab. Gadingsari
No. No. A/C 001 1234567
a.n. Angriawan Yevance Mailoa

Admin
Admin BUMDes Gadingsari

Angriawan Yevance Mailoa

Catatan: Proses transfer akan dilakukan setelah ada approval dari Manajer Keuangan.

FIGURE 6. Employee Salary Slip

User Acceptance Test or UAT is needed to ensure that the designed system runs as desired. For UAT, there were 18 respondents who took this questionnaire or User Acceptance Test to ensure that on the user's side, this system can run as desired. The results of this User Acceptance Test can be seen in **Table 1.**

TABLE 1. User Acceptance Test

No.	Acceptance Requirements	Variable			
		Strongly Agree	Agree	Disagree	Totally Disagree

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1	Is the system view easy to navigate?	13	5	0	0
2	Is the system easy to operate?	13	5	0	0
3	Does the system provide sufficient features?	9	9	0	0
4	Has the employee data entry process going as intended?	18	0	0	0
5	Is the salary calculation process correct and accurate?	17	1	0	0
6	Does the database usage help to process data?	18	0	0	0
7	Is the resulting salary slip corresponding as intended?	15	3	0	0
8	Can the output have processed quickly?	17	1	0	0

CONCLUSION

The system made consists of several features, namely employee data processing, attendance features, and fast and accurate salary calculations. This system can be used to help payroll faster, can be monitored, and more accurate. UAT test results show that this system is easy to navigate, easy to operate, provides sufficient features, precise and accurate salary calculation process, good data storage, and appropriate output. The waterfall method makes the analysis, design, implementation, testing, and maintenance easier to do and suitable for the village to achieve the goals.

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