

## Digitize Payroll Processes with Payroll Application to Improve Administration Efficiency

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### ABSTRACT

This research aims to design and build an information system for the payroll process using payroll applications at People's Credit Banks (BPR) to improve administrative efficiency. The background of this research focuses on the challenges of manual payroll, such as inaccuracies, delays, and errors in record-keeping. This research uses a structured Waterfall software development method, ranging from needs analysis to application maintenance. Data was collected through surveys, interviews, and documentation studies. The analysis was carried out to understand manual system constraints, identify the impact of digitalization, and evaluate speed, accuracy, and error reduction. The implementation of payroll applications allows for a faster, more accurate, and fewer errors payroll calculation process. In addition, this application also facilitates more structured and secure data management. The application also increases transparency in payroll management, provides clearer reports, and speeds up the audit process and internal control at BPR.

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## INTRODUCTION

The rapid development of information technology today has had a very significant and comprehensive impact on various sectors, including the banking sector which continues to transform along with technological advancements. One of the innovations that is growing and widely applied is digitalization in various administrative processes, one of which includes employee payroll. The digitization of payroll allows processes that were previously done manually, which are often time-consuming, prone to human error, and require a lot of manpower to ensure accuracy, to transform into more efficient, structured, and automated systems. By using digital technology, the payroll process has not only become faster, but also more accurate, reducing the likelihood of errors in calculations, as well as allowing for more transparent and accessible data management, which ultimately increases productivity and operational efficiency in the banking sector (Purwanto et al., 2022). Therefore, the implementation of an application-based payroll system is expected to improve administrative efficiency at the People's Credit Bank (BPR).

Bank Perkreditan Rakyat, as a financial institution that serves the MSME sector and the lower middle class, often faces challenges in terms of operational and managerial efficiency, including in terms of employee payroll management. The manual payroll system in BPRs can lead to inaccuracies in calculations, delays in salary payments, and high administrative burdens. Digitizing the payroll process can reduce these problems by utilizing applications that automate processes from salary calculations, deductions, to payments (Iryanie, 2024).

The implementation of digital-based payroll applications also provides advantages in terms of better and safer data management. Employee data, including payroll, benefits, and deductions, can be stored in a more structured and protected manner, reducing the risk of data loss or other administrative errors. Additionally, the app allows for automatic reporting generation, which can speed up the audit process and increase transparency within the organization (Grande et al., 2011).

One of the widely used technologies for payroll digitization is cloud-based applications, which allow real-time data access, anytime and anywhere, with a higher level of security. Another advantage is the savings in operational costs that were previously used for manual or hardware systems (Subekti, Ohyver, 2024). Therefore, it is important to explore the implementation of payroll applications in improving administrative efficiency in BPRs as a solution to existing problems.

## LITERATURE REVIEW

### *Digitalization and Business Process Transformation*

Digitalization refers to the use of digital technology to change the way business is conducted, including in terms of administrative and operational management. In the context of payroll, digitization allows the automation of the entire process of calculating, paying, and reporting payroll that was previously done manually. Digitalization allows companies to speed up business processes, reduce operational costs, and improve the quality of service to employees.

Digitalization also opens up opportunities for better data integration between systems and departments within the company (Ramadhani et al., 2024).

### ***Payroll Application as a Solution for Efficient Payroll Management***

The payroll application functions to manage various aspects of payroll, including the calculation of basic salary, allowances, deductions, and tax calculations automatically. In the implementation at Bank Perkreditan Rakyat (BPR), the use of payroll applications can increase efficiency in complex payroll administration processes. The implementation of a digital-based payroll system allows for time savings, reduced manual errors, and provides better access for employees to monitor and understand their paychecks. The system also allows companies to make more transparent and accurate calculations and payments (Rinaldiansyah Nugraha & Purnama, 2023).

Administrative efficiency is one of the main goals of digitalization, where technology is expected to replace manual work that is time-consuming and prone to errors. The implementation of information technology, such as a digital-based payroll system, can speed up administrative processes, reduce employee workloads, and improve the quality of decision-making. In the context of BPR, payroll digitization allows for smoother, faster, and more integrated management, as well as providing benefits in terms of transparency and accountability (Abubakari et al., 2023).

One of the challenges in digitalization is ensuring the security of employee data, including sensitive payroll information. The use of digital-based payroll applications must be accompanied by strong data protection so that employees' personal information does not fall into the wrong hands. One of the most important aspects of the implementation of a digital payroll system is data security through encryption and strict access controls. It is important to maintain employee trust in the systems used and to meet personal data protection standards.

## **METHODOLOGY**

### ***Software Development Methods***

In the development of a payroll application to digitize the payroll process at Bank Perkreditan Rakyat (BPR), the method used is the Waterfall method. This method was chosen for its simplicity and clearly structured stages, which are suitable for projects with clear needs and have not changed significantly during development (Sommerville, 2011). The Waterfall method allows for systematic application development, starting with needs analysis to the implementation and maintenance stages.

### ***Needs Analysis***

At this stage, the needs of the payroll system desired by BPR will be collected through interviews with stakeholders and analysis of existing payroll business processes. The functional and non-functional needs of the payroll application will be identified, including features such as payroll calculation, deduction management, and payroll reports (Pressman, 2014). The result of this

stage is the documentation of the system requirements that will serve as a reference for further development.

### ***System Design***

Once the system needs are determined, the next stage is system design, which includes application architecture design, user interface (UI), and database design. The design of this system will consider the ease of use, reliability, and security of data (Booch, 2007). The UI design will be tailored to the needs of users to ensure that payroll applications are easy to use by BPR administrative staff and employees.

### ***Development and Implementation***

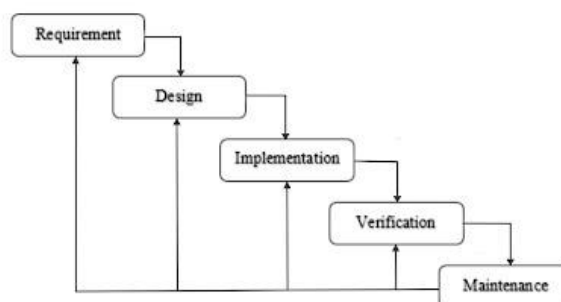
The development stage is carried out using appropriate programming languages and platforms that support integration with existing systems in BPR, such as PHP, Java, or Python, as well as MySQL or PostgreSQL databases. At this stage, unit testing will be carried out to ensure that each component of the application is working according to pre-defined specifications (Sommerville, 2011).

### ***System Testing***

After the application is completed, testing is carried out to ensure that the application works properly and according to the user's needs. Testing is carried out including testing functionality, performance, and security. This trial will involve the end user to get feedback on the interface and ease of use of the application (Pressman, 2014).

### ***Maintenance and Repair***

After the application is deployed in BPR, the maintenance phase begins with monitoring the application performance and fixing if problems are found. Updates and improvements will be carried out regularly to improve the functionality of the system and ensure that employee data is maintained (Booch, 2007) The stages of the waterfall method can be seen in the image below:



**Figure 1. Stages of the waterfall method**

### ***Data Collection Methods***

The data collection methods used in this study consist of two main types, namely primary data and secondary data. Primary data were obtained through surveys and interviews with parties involved in the payroll process at Bank

Perkreditan Rakyat (BPR), while secondary data was obtained from literature relevant to the topic of this research, such as journals, books, and previous research reports.

### *Survey*

The survey was conducted by distributing questionnaires to employees who were directly involved in the payroll process at BPR. This questionnaire contains questions related to experience, effectiveness, and satisfaction with the payroll application applied. The purpose of this survey is to measure the impact of the use of payroll applications on the efficiency of payroll administration, as well as to obtain data on the obstacles faced by system users (Creswell, 2014)

### *Interview*

Interviews were conducted with IT managers and staff involved in the implementation of payroll applications at BPR to explore the technical and administrative aspects of the payroll digitization process. This interview aims to gain deeper insight into the challenges faced during the implementation of payroll applications and to identify areas that need to be improved in the payroll system (Sekaran, 2003)

### *Documentation Studies*

In addition to interviews and surveys, secondary data was also collected through documentation studies that included previous payroll reports, payroll policy-related documents, and payroll application usage evaluation reports. This data will help to get a clearer picture of the changes that have occurred in the payroll process and the effectiveness of payroll applications from the administrative side (Yin, 2014)

## **RESEARCH RESULT**

The payroll system implemented at Bank BPR Batola currently still uses the manual method, with Microsoft Excel as the main tool in calculating and making payroll reports. Every month, employee salaries are paid through internal savings, which include several important components such as basic salary, overtime pay, bonuses, benefits, and social security facilities such as BPJS Employment and BPJS Kesehatan. This payroll process involves several procedures, namely the creation of a salary list by the teller which refers to the calculations that have been made by the operational director, then the disbursement of funds that require the approval of the two directors, as well as salary payments made by way of transfer to employee savings. Although there is a division of duties between the operational director, the president director, and the teller, the system still has some significant drawbacks, such as the mechanism of salary deductions made from the meal allowance, which is considered inappropriate and unfair. In addition, the use of manual methods risks causing data input errors and takes longer in the calculation process.

The results of the study show that Bank BPR Batola's payroll system still has a number of weaknesses that need to be improved to be more efficient and accurate. The use of Microsoft Excel in salary calculation is prone to human error,

and there are duplicate functions performed by operational directors that do not conform to the ideal task sharing principle in the organization. In addition, the procedure for making a payroll that should be carried out by the finance department still involves the teller part, which can increase the workload and increase the risk of errors. The existing organizational structure also needs to be improved, because the dual functions performed by the operational director hinder the efficiency of payroll management. In this case, poor payroll proof administration can also affect transparency and internal control. Therefore, it is recommended that Bank BPR Batola switch to a more specific and targeted application-based payroll system, which can speed up the payroll process, reduce the risk of errors, and improve the accuracy and efficiency of employee salary management in the future. Thus, a better payroll system can support more transparent and structured financial management.

The following is a view of payroll applications that can be a solution for Bank BPR Batola, replacing the use of Microsoft Excel which is still used today. The app is designed to simplify the payroll calculation process, reduce the likelihood of errors, and provide clearer and more efficient reports. With an easy-to-understand interface, the app can help speed up payroll management, making it more practical and accurate for all parties involved. As previously researched, it was able to reduce miscalculations and speed up the process of distributing payslips (Arfan et al., 2025; Mahardika et al., 2023).

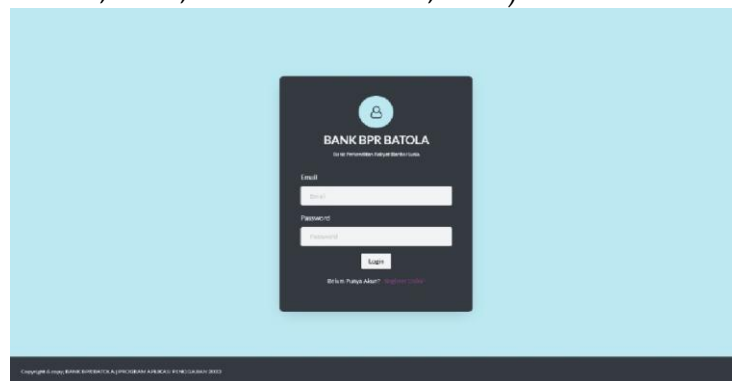


Figure 2. Login Page

The dashboard page is a view that appears after the login process is successful.

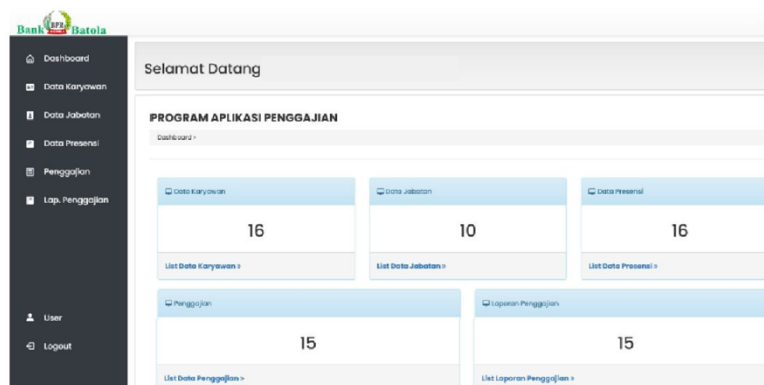


Figure 3. Dashboard Page

Master Data is a collection of important information at Bank BPR Batola which includes employee data, positions, and employee attendance. In the payroll application created, users can access the master data table to make it easier to manage the data.

## DISCUSSION

This research focuses on the application of payroll applications in payroll digitization at Bank Perkreditan Rakyat (BPR) Batola, with the aim of increasing efficiency in administration. Based on the results of the study, it can be concluded that the manual payroll system that was implemented previously has several significant weaknesses, such as the risk of miscalculations, late payments, and high administrative burdens that must be handled. Digitization through the use of payroll applications has been proven to provide a more effective solution, because it can speed up the salary calculation process, increase accuracy, and reduce errors in payroll data management.

One of the important findings of this study is the improvement of the operational efficiency of Bank BPR Batola after the implementation of the payroll application. The payroll process that used to take a long time, can now be done faster and more accurately. This not only improves internal efficiency, but also provides clearer transparency related to employee payroll management. Clarity of reports and ease of audit process are clear advantages for internal control at Bank BPR Batola, which ultimately supports better decision-making by payroll management (Arifin et al., 2025; Lubis et al., 2024).

However, this payroll application has not been fully optimized. Based on the conclusions of the study, the use of this application should be expanded to all branches of Bank BPR Batola to ensure better data integration and maximum transparency. Additionally, it is important to continue to strengthen the protection of employees' personal data through the implementation of better layers of security, such as encryption and strict access controls, to prevent potential data leaks. Periodic training for staff is also an important aspect so that the application can be used optimally and according to existing needs.

In addition, the payroll application system needs to undergo regular maintenance and updates to stay relevant to technological developments and changing organizational policies. One of the aspects that needs to be adjusted is the policy related to the management of attendance and salary deductions, so that the calculation process is fairer and more efficient. These adjustments will be critical in improving accuracy and fairness in employee payroll management in the future.

Overall, the implementation of the payroll application at Bank BPR Batola has a positive impact on operational efficiency and can be used as an example for other sectors that want to transform digitally. However, as with any technology system, the successful implementation of these applications depends on continuous management, continuous improvement, and adaptation to the needs of organizations and employees. Therefore, it is important for Bank BPR Batola to continue to evaluate and develop this application to provide maximum benefits, both for the organization and employees.

## **CONCLUSIONS AND RECOMMENDATIONS**

This research designed a payroll application for payroll digitization at the People's Credit Bank (BPR) to improve efficiency in payroll administration. Previously, the manual payroll system that was implemented had several drawbacks, such as errors in calculations, late payments, and high administrative burdens. With digitalization, payroll applications can address these problems more effectively. The implementation of the payroll application allows for a faster, more accurate, and less error-free salary calculation process. In addition, the application facilitates more structured and secure data management, as well as increasing transparency in payroll management. The application also provides clearer reports, speeds up the audit process, and improves internal control in BPRs. Overall, the use of payroll applications has a positive impact on Bank BPR's operational efficiency and can be an example for other sectors that want to transform digitally.

To maximize the benefits of this payroll application, Bank BPR Batola should expand its use in all branches to increase data integration and transparency in the payroll process. Additionally, it's important to continue to strengthen employee personal data protection by adding a better layer of security, such as encryption and strict access controls. In order for the application to be used optimally, periodic training for staff is also necessary to ensure that they understand how to use the system properly. In addition, these systems must undergo regular maintenance and updates to keep them functioning properly and relevant to the needs of the organization. Finally, adjusting payroll applications to organizational policies, especially those related to attendance management and salary deductions, will increase fairness and efficiency in the process of calculating employee salaries.

## **ADVANCED RESEARCH**

For further research, it is recommended to explore the influence of the integration of payroll applications with financial management and accounting systems at Bank BPR Batola, to analyze how this system can improve the efficiency of budget management and overall financial planning. This research can examine the potential for automation in payroll-related accounting processes, including the creation of more accurate and timely financial reports.

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