

**ePayroll Bio: HUMAN RESOURCE MANAGEMENT OFFICE PAYROLL
SYSTEM WITH BIOMETRIC TECHNOLOGY FOR MUNICIPALITY OF
PALUAN**

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CHAPTER I

BACKGROUND OF THE STUDY

Introduction

The Human Resource Management Office (HRMO) stands as the cornerstone of any thriving organization, acting as the vital link between the institution's strategic objectives and its most valuable asset: its people. Functioning as more than just an administrative body, the HRMO orchestrates the employee lifecycle from recruitment and onboarding to development, compensation, and separation. It is the central hub for fostering a productive and positive work environment, ensuring compliance with labor laws, and cultivating a culture that attracts, retains, and motivates talent. In essence, the HRMO is instrumental in shaping the organizational landscape and driving its overall success (Dessler & Varkkey, 2020). A well-functioning HRMO is instrumental in aligning human capital with the strategic goals of the organization. It achieves this through strategic workforce planning, talent acquisition, and the implementation of effective performance management systems. Furthermore, the HRMO is responsible for cultivating a positive work environment by addressing employee relations, ensuring fair compensation and benefits, and promoting employee well-being. By effectively managing these crucial aspects, the HRMO contributes significantly to organizational effectiveness and a thriving workplace culture (Nawaz & Gomes, 2021). The Human Resource Management Office transcends the traditional perception of a purely administrative unit. It embodies a strategic partnership that empowers both the organization and its employees to reach their full potential. By effectively managing the human element, the HRMO contributes significantly to enhanced

productivity, reduced turnover, and a strengthened organizational reputation, solidifying its indispensable role in navigating the complexities of the modern workplace (Williams, 2023). In multicultural work environments, all organizational objectives are examined from where their human resource strategic value and structures clout and resonate. HR is comprised of org culture, leadership, change, growth, motivation, performance, well-being and hiring (Bocharova & Yarovy, 2024).

The processing of data obtained by manual recording, without the use of computer systems, always takes more time than expected (Orane, 2020). The importance of effective human resource management is essential for the smooth functioning and governance of any local government unit. A key aspect of this management is the precise and timely processing of payroll, which ensures that employees receive the correct compensation for their work. Payroll systems, which often depend on manual data entry and paper processes, are prone to errors, inefficiencies, and even fraud (Cole, 2020). A lack of reliable timekeeping systems can lead to inconsistencies between actual and reported work hours, affecting the municipality's financial resources. To address these challenges, incorporating technology into human resource management, especially in payroll systems, has become vital for modernization and enhanced efficiency. One significant technological advancement is the use of biometric features for tracking employee time and attendance. Biometrics, which utilizes unique biological traits for identification, provides a secure and reliable way to confirm employee presence and monitor working hours (Jones & Brown, 2020). The Municipality of Paluan, similar to many other local government units, likely encounters challenges related to traditional payroll systems. Implementing a payroll system that incorporates biometric features could greatly improve the efficiency, accuracy, and

security of its human resource management processes. This essay will examine the potential benefits and considerations of introducing such a system in the context of the Municipality of Paluan. Biometric technology, which uses unique biological characteristics for identification and verification, provides a secure and precise approach to managing employee timekeeping and attendance (Veridian, 2023).

Through an interview, based on preliminary observations and conversations, the researchers have found some of the continuing challenges faced with HR management include tracking incomplete leave forms and manual time logging processes. The manual process being used for calculating salary and deductions is also very error prone leading to many errors. The processing of employee data obtained by manual recording, without the use of computer systems, always takes more time than expected. This dependence on manual procedures can result in mistakes in salary calculations, delays in wage distribution, and challenges in producing precise payroll reports. By integrating fingerprint, the proposed system aims to eliminate manual timesheets, minimize the risk of "buddy punching," and offer real-time data on employee attendance, thereby improving payroll accuracy and efficiency.

To tackle these important challenges and improve the operational efficiency of the Human Resource Management Office (HRMO) in the Municipality of Paluan, this capstone project suggests creating and implementing an Office Payroll System with Biometric Features. Integrating fingerprint, the proposed system aims to eliminate manual timesheets, minimize the risk of "buddy punching," and offer real-time data on employee attendance, thereby improving payroll accuracy and efficiency (Martinez et al., 2021). The

goal of this solution is to automate the payroll process, incorporate a secure and dependable biometric system for accurate attendance tracking, and offer extensive reporting capabilities. By utilizing biometric technology for precise employee identification and attendance monitoring, the proposed system will eliminate the need for manual timesheet processing, reduce the risk of timekeeping fraud, and ensure accurate employee compensation calculations. The integrated payroll system will simplify the generation of payslips, manage statutory deductions, and provide HR staff with real-time access to essential payroll information for better decision-making. Ultimately, this project aims to establish a more efficient, transparent, and secure payroll management system that enhances resource management and overall administrative effectiveness in the Municipality of Paluan.

Objectives of the Study

The study aimed to design and develop a Payroll System with Biometric Technology for calculating salaries of Employees in HRMO Municipality of Paluan.

1. Specifically, to design a system with the following features:
 - a. To implement biometric technologies to ensure fidelity in attendance monitoring and tracking.
 - b. To create a system with automatic calculation and deduction that is intuitive and easy for HRMO staff to navigate and operate efficiently

- c. To create a system to manage of HR staff the data, including the distribution of salary.
 - d. To determine the system's impact on reducing manual errors and administrative workload for the HRMO staff.
2. To create a system with the use of the following application:
- a. Typescript
 - b. Tailwind CSS
 - c. Next.js
 - d. Node.js
3. To evaluate the system based on the criteria from ISO 25010 with the following criteria: functional suitability, performance efficiency, compatibility, interaction capability, reliability, security and maintainability.

Significance of the Study

The study is significant to the following:

HRMO staff. This study provides insights into optimizing payroll procedures, which could decrease manual mistakes and the time invested in calculations and data input. which directly affects payroll precision and reduces inconsistencies associated with time tracking. This enhanced efficiency can allow HR staff to concentrate on more strategic activities, like talent management and employee development

Employees / Staff. The research enables employee/staff members to benefit by both streamlining organizational processes and improving transparency levels. Staff

members can easily request their leaves through the digital application process without paper forms or manual signatures. Every month staff members can see accurate wage information under pay slip online access which doesn't need manual processing. Such confidence enhancement leads to fewer problems related to payroll administration. The system enables self-service features through which staff members can actively control their career advancement along with personal growth. Employee satisfaction and work efficiency improve because the system increases general organizational efficiency alongside improved communication channels.

Future Researchers. The research findings will lead researchers who want to modernize HR management systems toward applying these findings in website and mobile application revisions. Researchers enhance HR technology advancement and creativity through persistent observation of user inputs and performance indicators which produces definitions of connection toward technological advancement

Conceptual Framework of the Study

Fig. 1 shows the input needed by the researchers. The input requirements, such as knowledge, software, and hardware, are required for project development. The process includes data gathering, system analysis, system design, system development, system testing and improvement, finalization, and maintenance. These processes will guide the proponents in producing the output, which is ePayroll Bio.

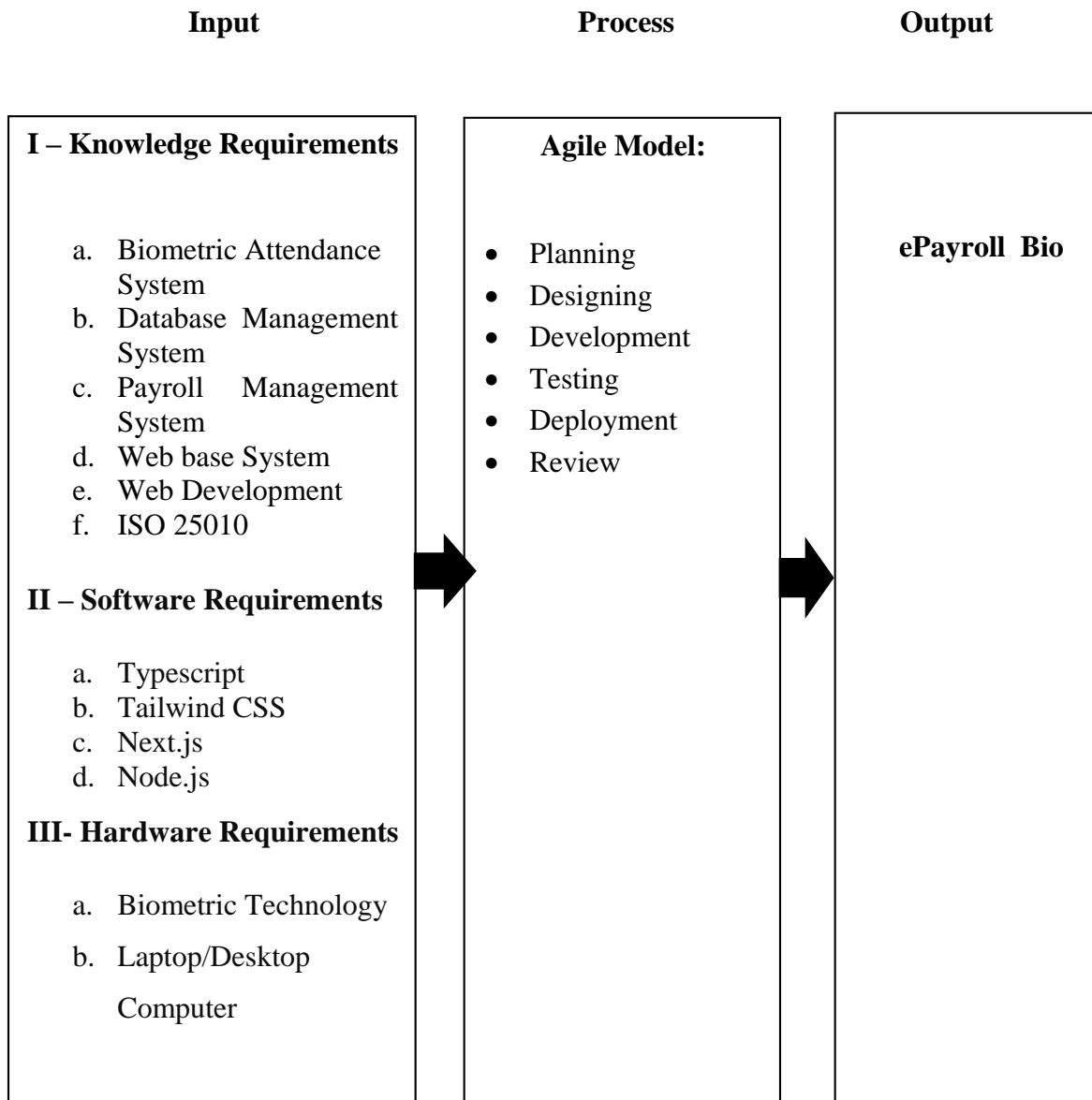


Fig. 1. The research paradigm of the study.

Scope and Limitations of the Study

The goal of developing a web-based system is to minimize inefficiencies in the human resource management office current manual processes by creating and deploying a web-based payroll and human resource management system (HRMS) with biometric technologies in Paluan, Occidental Mindoro. Through a user-friendly web interface available from various devices, the system will handle employee data, track attendance via

biometric verification (fingerprint scanning), automate payroll calculations, and ease leave requests. Strong security protocols will be put in place. Concerning non-functional features, the system will classify performance efficiency, securing cause, and exact payroll and attendance processing. Safely keeping and handling employee data will preserve reliable scope. The key essence will be compatibility, providing entry from different browsers and devices. A detailed and modest interface for employees and HR staff will enhance usability. Biometric devices and a secure internet connection are necessary for the system's reliability. To protect vulnerable personnel record, security practices such as user authentication and information encryption will be enforced.

Additionally, the system's portability will allow it to handle beyond many platforms without meaningful modification. The system is intended for store management, human resources (HR) staff, and employees. Employees will use the system to request leave, review their records, and operate biometric scanning for attendance confirmation. HR personnel will be accountable for processing payroll, approving leave requests, and managing employee information. Store administration will supervise operations, monitor employee attendance, and ensure that payroll processes run smoothly. The system is intended to increase user productivity by automating processes and decreasing manual.

Operational Definition of Terms

For better clarification and understanding of the terms used in this study, the following terms are defined conceptually.

Agile Model. It is a system development process to enables iterative development, continuous feedback, collaboration, and adaptability, ensuring that the project meets

evolving requirements and user needs. In the study, the agile methodology will be used as the system development methodology.

Database. This is where the inventory records, user information, and transaction history will be stored. In the study, the database will be used to store the data that the system will gather.

Biometric Features: In the context of this study, biometric features specifically refer to the use of unique biological characteristics of employees such as fingerprints for the purpose of timekeeping and attendance management.

Payroll System. This refers to the software application designed and developed in this study to automate the process of managing employee compensation within the Municipality of Paluan HRMO.

ISO 25010. It provides a framework to evaluate software quality based on specific criteria, including functional suitability, reliability, interaction capability, efficiency, maintainability, compatibility, and security.

CHAPTER II

REVIEW OF THE RELATED LITERATURE AND STUDIES

This study presents a review of related literature directly relevant to the development of the study.

Biometric Attendance System

The project titled "Design, Development, and Testing of a Human Resource Information System (HRIS) for Cagayan State University - Aparri Campus" addresses these challenges by providing a web-based HRIS that streamlines HR functions and enhances operational efficiency. The system is designed for quick data entry and retrieval, providing a more organized and efficient means of managing personnel records. The Agile Development Model, implemented within the established framework of the System Development Life Cycle (SDLC) was used. The assessment of the HRIS developed at CSU Aparri shows it as a robust and effective system, meeting ISO 25010:2011 standards. IT experts rated it highly across compatibility, security, usability, functionality, performance stability, maintainability, and portability. Compatibility and security were particularly praised for their adaptability and stringent data protection. While usability scored slightly lower, it still indicates efficient navigation and user satisfaction. End-users reported high satisfaction, perceiving the HRIS as beneficial and expressing strong intentions to continue using it. These results affirm the HRIS's success in meeting IT and user needs, highlighting its reliability, security, and overall effectiveness, with room for further usability

enhancements. The application ultimately contributes to better decision-making and improved administrative efficiency (Liquigan and Javier). The research attempts to improve the efficacy and efficiency of the academic institution's HR procedures. The design and implementation of a cutting-edge employment tracking system with file routing methods is the main focus of this work. The system streamlines the hiring, onboarding and personnel management procedures and is customized to fit Adamson University's unique requirements. By incorporating emerging technology, the study tackles issues that the HR department faces and facilitates a smooth exchange of data and documents. The suggested method makes sure that the employee records are tracked accurately and promptly. It also makes it easier for various HR departments to collaborate. (Alvez et al.)

The efficacy in the procedure of getting employee attendance can be maximized when the IOT Based Biometric attendance system i.e. smart attendance system is used. The employee's attendance is recorded using biometric scanner which is fingerprint based and then the data is secured safely over a cloud storage. The system averts the proxy attendance, time will also be saved, thereby the reliability of employee's attendance information is also maximized. The employee's data are loaded securely over the cloud and can be easily fetched according to the need. This research paper throws a light on simple, easier and portable method for employees attendance in which internet of things is used (Jain et al., "IoT Based Biometric Attendance System"). Biometric technological methodologies which encircles authentication & verification of persons by analyzing unique human's body traits, has found broad applications at numerous sectors of existence, with a substantial emphasis on worker attendance management in this specific research. While

the benefits of biometric technologies are numerous, and their impact extends across various sectors globally, many users face obstacles when it pertains to picking the most appropriate and affordable biometric data technology system customized to address unique issues in specific environments research investigation was conducted in the telecommute industry of Nigeria's South West area for this study report. The primary goal was to develop a unique biometric identifier capable of improving their present employee attendance system, which is now impeding the organization's efficiency. The study took quantitative approaches, with any questionnaire serving as datasets gathering method to evaluate several biometric technologies. The poll included 37 employees who were chosen using stratified random sampling. The data indisputably indicate the fingerprint biometric identifiers appropriateness for enhancing the organization's employee attendance management system. As a result, it recognized the need of assessing a variety of criteria before suggesting the use of biometric information technology to improve an organization's business productivity Rakhra et al. ("Implementing Fingerprint Biometric Authentication to Enrich the Staff Attendance System"). The traditional validation process of the attendance system today still has myriad threats in its use. One of that is popularly known as the manipulation of attendance data (especially if using paper-based). This study aims to improve security during the validation system by designing a security document that can be used as a guide when developing an attendance system. After following each step in the common criteria framework, a security document will be generated later. The document is also commonly referred to as the Protection Profile (PP) of the document. PP documents can be used as a basic guide when a developer will build a product. Generally, products related to security aspects need this kind of guidance. By describing 6 threats

which are divided into 6 Security Objectives (SO). 11 Security Functional Requirements (SFR) are needed to deal with the threat. And at the end of the section, it is illustrated the correlation each SFR has been able to overcome all threats. With every threat, SO, and SFR mapped (Yasirandi et al.).

Database Management System

The Database Management System plays an essential part in managing all aspects of human resource operations through features that handle payroll and leave procedures and employee assessment and data retention functions respectively. This paper developed an Online leave management system in the human resource local government unit at Magallanes Agusan Del Norte, Philippines, to easily track the online leave status, balances, and employee leave requests. In the planning phase, the developers interviewed the HRMO personnel and the head of the office. The logical model is developed in the analysis phase by designing the Context Data Flow Diagram, Use Case Diagram and System Architecture. Design phase, where the developers built the Online Leave Management System by writing codes in Visual Studio Code (VSCode) using HyperText Markup Language (HTML5), Bootstrap5, and JavaScript with jQuery as the frontend while the backend was Structured by HyperText Preprocessor (PHP) with Laravel Framework. Before the implementation phase, the functionality and security of the system were checked by evaluating the system for the endusers. The system's overall performance in terms of Functional Suitability, Usability, Security, and User Satisfaction makes the system highly acceptable to the end-users. Index Terms—Online Leave Management System, Human Resource Local Government Unit, Leave Status (Cuarez et al.) The database management process, which

uses MySQL software for user management, data request, management, admin administration, and tool and data management, is used to handle huge amounts of data (Rawat et al.). Internet of Things (IoT) is a network paradigm in which physical, digital, and virtual objects are equipped with identification, detection, networking, and processing functions to communicate with each other and with other devices and services on the Internet in order to perform the users' required tasks. Many IoT applications are provided to bring comfort and facilitate the human life. In addition, the application of IoT technologies in the automotive industry has given rise to the concept of Industrial Internet of Things (IIoT) which facilitated using of Cyber Physical Systems, in which machines and humans interact. Due to the diversity, heterogeneity, and large volume of data generated by these entities, the use of traditional database management systems is not suitable in general. In the design of IoT data management systems, many distinctive principles should be considered. These different principles allowed the proposal of several approaches for IoT data management. Some middleware or architecture-oriented solutions facilitate the integration of generated data. Other available solutions provide efficient storage and indexing structured and unstructured data as well as the support to the NoSQL language. Thus, this paper identifies the most relevant concepts of data management in IoT, surveys the current solutions proposed for IoT data management, discusses the most promising solutions, and identifies relevant open research issues on the topic providing guidelines for further contributions (Diène et al.).

Payroll Management System

The present study is descriptive research in terms of purpose, descriptive analysis in terms of nature and cross-sectional research in terms of time. The study's statistical population includes all employees and managers of the China City Organization selected as sample members using random sampling method and Krejcie table of 242 people. The questionnaire was modified and revised based on the goals, tasks and mission of the target organization to collect information. In data analysis, due to the normality of data distribution, the structural equation modeling method is used to evaluate the causal model, reliability and validity of the measurement model. Evaluation and validation of the model are done through the structural equation model. Questionnaire-based model and data are analyzed using Smart PLS 3.0. The main purpose of this study is to assess the feasibility of implementing the human resource payroll management system based on cloud computing technology (Zhao and Rabiei). Internship is defined as obtaining practical experience from various organizations, which helps in the formation of a connection between theoretical and practical knowledge. It is very important because it is the first time for a student to acquire a keen practical knowledge from the different organizations. When I was offered an internship at Norban Comptex Ltd. I got the chance to work and learn with developer team. The project's goal was to create a framework for Norban Comptex Ltd named "Payroll Management System". This report covers the whole project that I learned about throughout my internship period. I had to finish my learning sessions before working on any project, and in this learning session, I was allocated to Employee management, add new employee, different interface for different parts and their back-end codes. It was almost like a skill test before the actual project was assigned. I have detailed the

information and experiences I have gained and the work I have done as an intern at Norban Comptex Ltd. In this report. I worked on a website application where the most of my tasks included developing the entire site (Md. Jahangir).

The payroll system is crucial for ensuring smooth operations in government institutions. A payroll system must include several documents used to determine an employee's salary. This study employs a descriptive research approach. The research variable is the payroll accounting system of the Personnel and Human Resource Development Agency of Kotabaru Regency. The data used consists of primary and secondary data. Primary data includes payroll process data for flowchart processing, while secondary data comprises a brief history, organizational structure, and documents related to the payroll accounting system. Data collection methods involve interviews and documentation. The research findings indicate that the payroll accounting system for civil servants at the Personnel and Human Resource Development Agency of Kotabaru Regency has been implemented in accordance with accounting system standards (Minanda Putri Ramadhan et al.).

Web-Based System

Scientists in the Philippines have exhaustively studied web-based systems for human resources (HR) functions while authors have implemented several systems already. Web-based systems seek to create better management practices and enhance productivity levels during the optimization of all HR processes. Studies showed that web-based technologies with the Department of Health functioned to support the HR initiative known as the Program to Institutionalize Meritocracy and Excellence in Human Resource Management (PRIME-HRM) through its cloud-based HR management systems (HRMS).

(Manahan et al., 2022). Moreover, research on Web-Based Employee Recruitment Information Systems demonstrates how e-Recruitment can assist organizations seeking qualified candidates in managing databases and streamlining the hiring process (Rahmayan & Jayanti, 2023).

Every organization depends on its employees for its foundation and most employee data management currently depends on manual techniques. Every employee record includes a combination of work schedules with payment information along with personal data and leave request procedures. The manual approach to these processes requires extensive time while simultaneously creating many administrative documents and introducing the possibility of human errors. Most modern computerized people management systems face operational issues mainly because their primary focus lies on payroll tracking and monitoring time off and employee presence. The proposed research indicates developing an online employee management system which will remedy existing problems. This system contains capabilities to resolve present system limitations while maintaining efficient employee data management. The system uses contempora MongoDB as database together with React, Node and Express JS to achieve quicker and simpler functionality (Sanuji et al., 2022).

Web Development

Through web development users can engage smoothly with platforms and exchange information effectively between multiple platforms for communication. By maximizing testing capabilities and deployment quality improvements automated testing platforms in web applications make certain the delivery of premium software products. Web portals

which specialize in alumni networking demonstrate how web applications improve information exchange and communication processes (Ferdiansyah et al., 2020). The field of web development enables better learning through collaborative systems that deliver immediate feedback to students according to examples demonstrated in programming education (Maarek & McGregor, 2020).

Web programming alongside design advancements through Bootstrap framework have resulted in better user-friendly digital content that improves its quality. The developments in the field have made web development a critical component for building present-day interfaces with an intuitive design. (Fedorchuk et al., 2023). Organizational tasks have undergone technological changes during the past decades that extended to human resources operations. Through automation of daily operations and digital platform use HR professionals free up time which enables them to commit their efforts toward crucial initiatives like talent selection and employee bonding and workforce design. e-HR emerged as a result of digital solution development to incorporate digital and web-based tools into human resource management thus streamlining administrative operations while helping HR teams devote themselves to strategic goals (None, 2022).

ISO 25010

The implementation of ISO 25010 standards provides essential operational support to Human Resource Information Systems (HRIS) which operate in multiple business sectors primarily among Philippine retailers. The implementation of machine learning features within HRIS allows organizations efficient record management and employee turnover prediction while generating valuable project insights. The tools reveal their dual advantage

by increasing productivity as well as enabling organizations to gain better understanding of their workforce and make accurate decisions (Pomperada, 2022). Software development utilizes the ISO 25010 standard as a tool to evaluate various elements of quality including functionality alongside reliability together with speed and usability alongside compatibility with precision of provided information. An assessment of these elements enables professionals to guarantee effective software operation alongside achievement of intended purpose. The correct operation and friendly user experience of the software can be confirmed through this process (Trichkova-Kashamova, 2021). This standard provides a structure for the objective assessment of software solutions, minimizing the influence of subjectivity in the evaluation process (Falco & Robiolo, 2021).

Systems are produced with high security levels and user-friendly features through research proven integration of the ISO/IEC 9126 and ISO/IEC 25010 quality models. The goal of these models is to develop operationally simple systems that protect users from threats. System design through the prioritization of these important characteristics leads to functions which offer secure use combined with friendly interface usability. Users can protect their personal data through this system because they have both security assurance and effortless navigation abilities (Sulistiani & Nursaeni, 2022). Different businesses use their own methods for performing aspect evaluations through adherence to ISO/IEC 25010 standards. The Goal-Question-Metric (GQM) procedure functions as a widely applied technique for assessing product or service quality. The evaluation technique GQM concentrates its examination on usability attributes as well as performance benchmarks and maintenance practicability because these elements are essential to customers. The established features guarantee that the assessed item satisfies the requirements of its target

user base. (Yuniasri, et al., 2020). The assessment of Cucumber and Mocha tools evaluates their effectiveness using the criteria of ISO 25010 standards that measure tool time performance and resource consumption and management functions. ISO 25010 standards require tests to determine operational speed and memory consumption of tools as well as multitasking capabilities. These aspects of analysis ensure these tools operate effectively while carrying out their designed purposes (Keibach & Shayesteh, 2022).

CHAPTER III

METHODOLOGY

This chapter outlines the design of the project, the development process, the operational and testing protocols, along with the methods for evaluation.

Project Design

In the design and development of the Human Resource Office Payroll System, the hierarchical diagram presented in Figure 2 shows the actual design and process of the expected output. The system has a main screen that includes Eight (6) pages such as Dashboard, Employee, Leave, Attendance, Wage Management, Setting, The Dashboard, which displays the four cards in the first card is the total of permanent employees then the second cards total of the contractual employees and the third one is Job-order employees and the last cards is total of all employees in the municipality then the Pai chart show the total On leave employees and then the pending leave and the total of leave. Employee show the info about the all employees there's have a three kinds of employees the Permanent, Contractual and the Job-order every employees you can see the information of an employee then the documents and specially the payslip. Leave lists, which involve the approval leave of an employee and history leave. Attendance it involves deals with employee attendance management, which the history show all the recent attendance. It includes Add Attendance "Add Attendance" is also shown as a feature accessible from the "Daily Log," implying a direct way to input attendance records within the log view. Wage Management, This button focuses on payroll management. It branches into Daily Wage and Summary Wage, suggesting the system can handle different pay frequencies or

provide summarized wage information. Setting allows administrator to configure system parameters, then generate the paslip report. Logout function for users to securely exit the system.

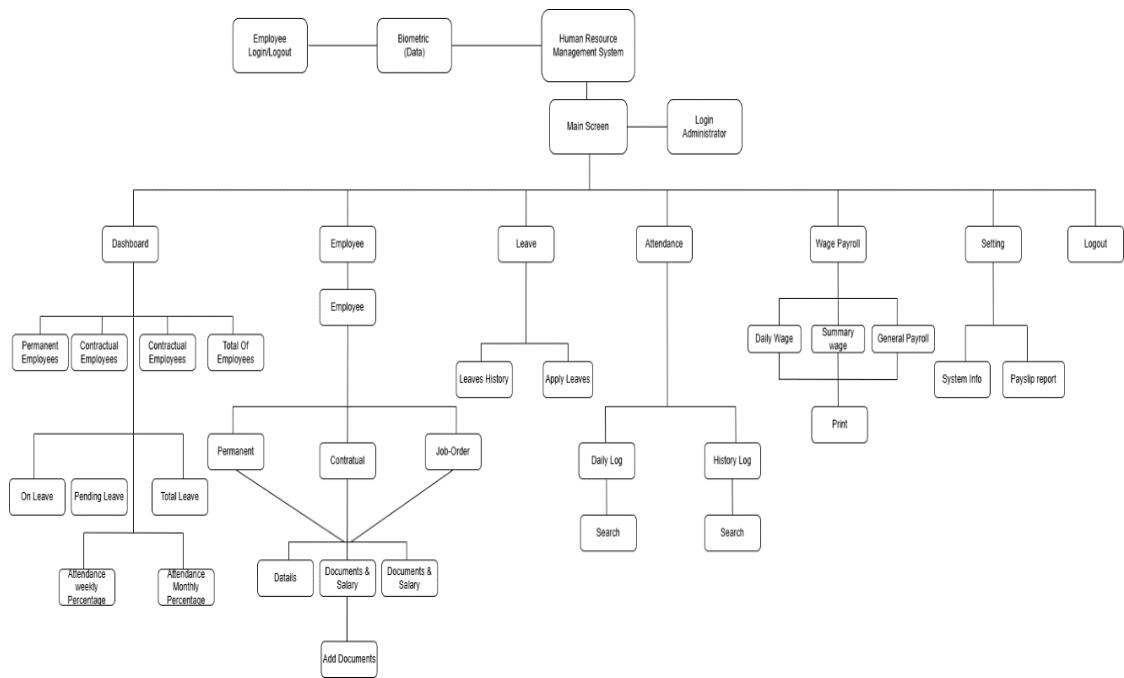


Fig. 2. Hierarchical diagram of HRMO payroll system

In Figure 3, shows the use-case diagram that describes the interaction between the system and the computer laboratory custodian. Specifically, to determine the function of the user which will be tasks to login the system, add, edit, view and print records.



Fig. 3. Use-case diagram.

In Figure 4, the data flow diagram level 0 outlines how the HR staff interacts with the payroll system. The HR staff manage leave request and wages of an employees into the system, which help track the leave request from employee. Additionally, the system generates payslip reports, general payroll, attendance, This general report show the sallry of the employees every office.

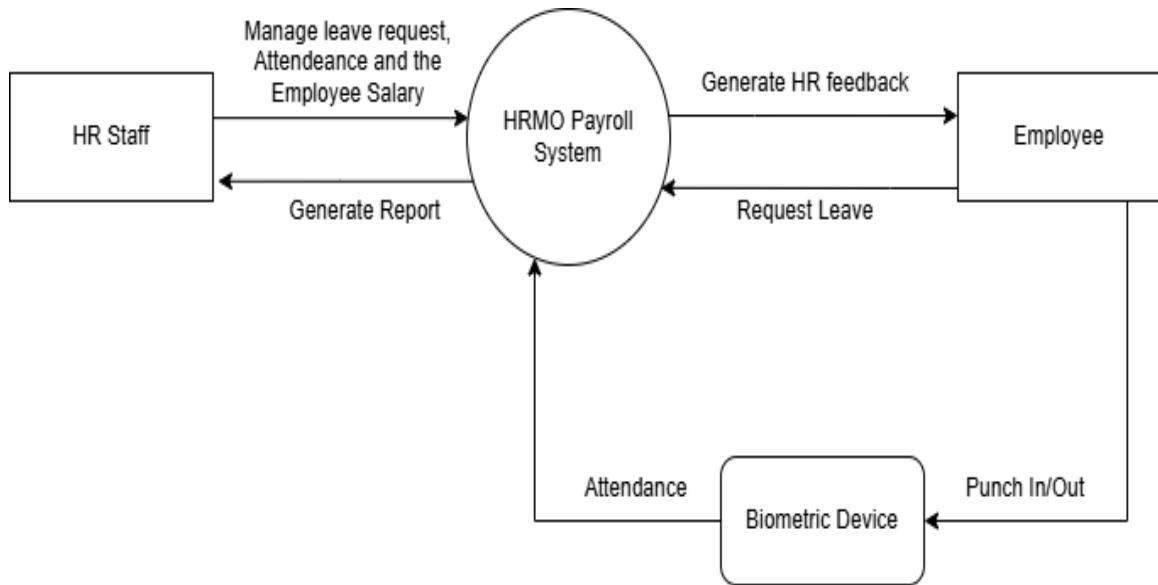


Fig. 4. Data flow diagram level 0

In figure 5, shows the data flow diagram level 1 showcases the operational flow of the human resource management system payroll system, specifically focusing on the tasks performed by the HR staff. The HR Staff initiates the process by logging into the account, gaining access to the system. Once logged in, they proceed to Employee to the system, to view the employee records and payslip, the HR leave process, which admin can manage the request leave and view leave history. Attendance which include the daily log and the history log. Payroll management which involve the daily wage and summary wage of all employee. On employee side they can view the attendance and download the payslip, the biometric include the time in and time out of the employee. Additionally, the HR staff is responsible for managing the Attendance and Wage record, ensuring accurate records of employee in municipality.

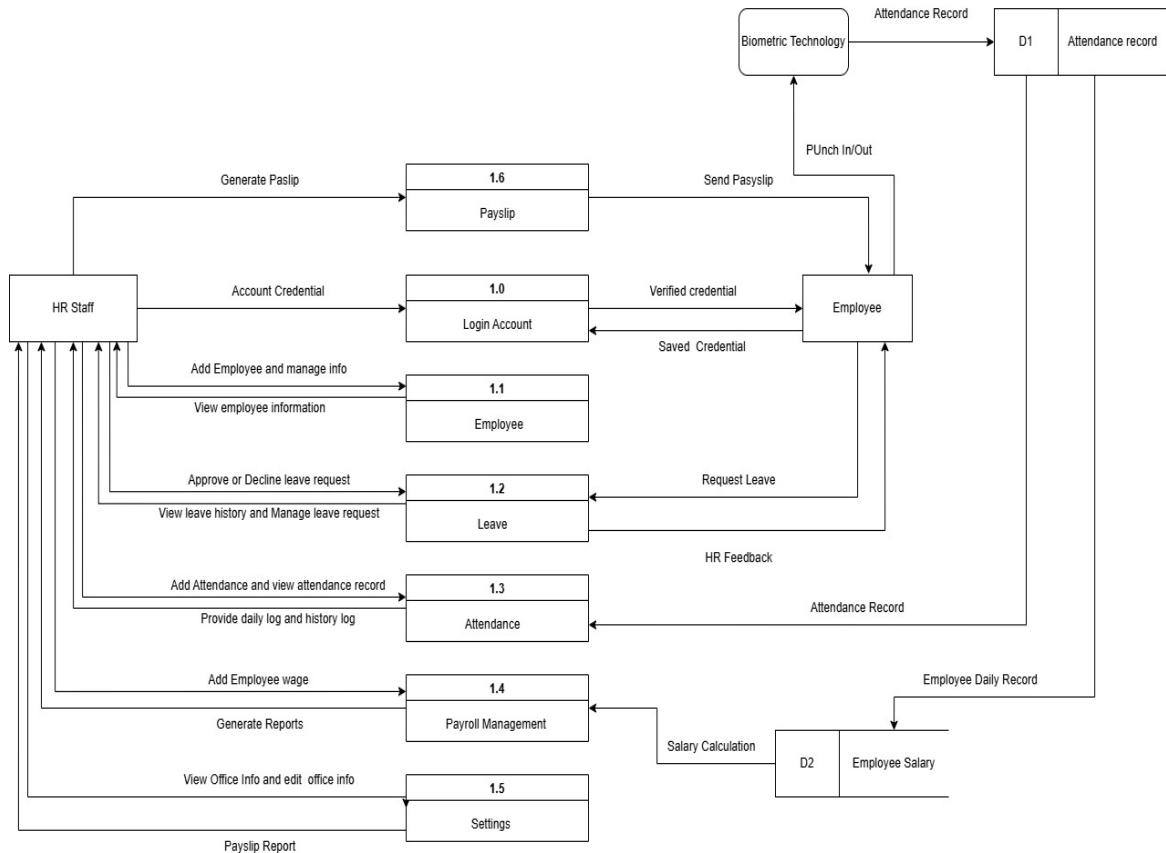


Fig. 5. Data flow diagram level 1.

Project Development

The Agile model was used in the system project development process of the study. The following are the phases that were done during the development: planning, design, development, testing, deployment, and review.

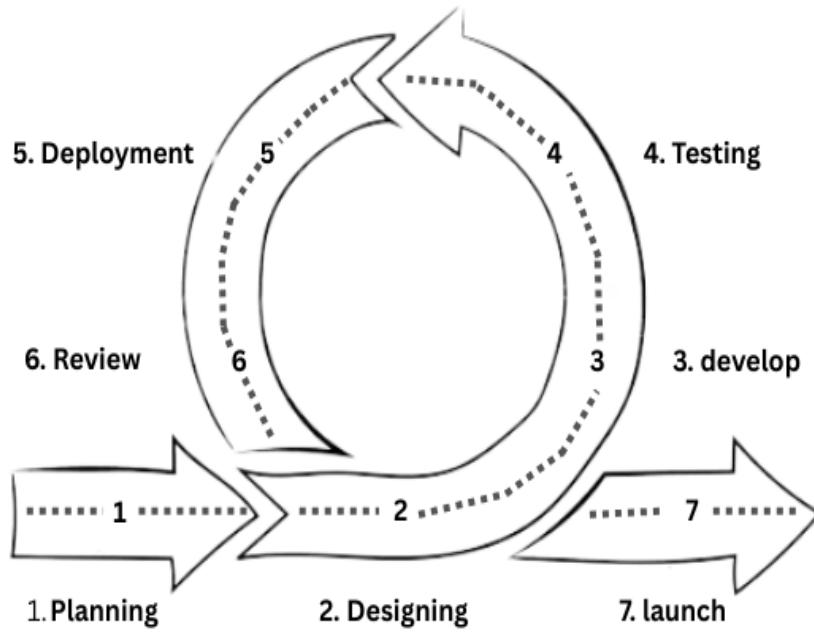


Fig. 4. Agile development model of the study.

Project Development of the Study

The Agile Model serves as the project development procedure for the system development. Through its iterative development process Agile enables ongoing improvement of project development during all lifecycle phases. The project includes these sequential stages: Planning, Designing, Development, Testing, Deployment, Review, and Final Output of the project.

Planning. In this phase, the proponents begin collecting all the necessary data from the clients and concerned offices. The proponent gathers information from research articles relevant to the study. The researchers also define the expectations and requirements. Additionally, the proponents will outline the project's scope and establish a timeline for completion. This phase involves setting clear objectives, identifying potential challenges, and developing strategies to address them. The proponents will also coordinate with

stakeholders to ensure that all perspectives are considered, and project goals align with client needs.

Designing. Once the proponents had gathered all the necessary data, they began designing the system. There are User requirements, interaction capability, Accessibility, Consistency, Aesthetic, Responsiveness, Performance, Feedback mechanism, Security and privacy, Scalability, Error handling, User testing, Interoperability, Legal and compliance, Documentation, and support to consider during this process especially to make sure that the design of the system is effective and user-friendly and meets the needs of its user.

Development. This procedure will be carried out according to designing phase. During this process, the proponents will begin implementing functionalities into the system by applying source code, ensuring it is beneficial to users and relevant offices. Using programming languages and development frameworks appropriate for the project, the proponents will implement the features and functionalities outlined in the design phase. They will employ tools such as integrated development environments (IDEs) and version control systems to manage the code base efficiently. Testing and debugging 25 will*conducted throughout the development process to ensure the system operates smoothly and meets the specified requirements.

Testing. In this stage, the system will go through several testing processes. The researchers will use the evaluation tool to present the generated system. This includes unit testing to ensure individual components function correctly, integration testing to verify that different modules work together seamlessly, and system testing to evaluate the overall performance of the system. User acceptance testing (UAT) will also be conducted, where actual users will interact with the system to confirm it meets their needs and expectations.

Any issues identified during these testing processes will be documented and addressed promptly to ensure the system's reliability and effectiveness.

Deployment. At this stage, the system will undergo testing to allow proponents to collect user responses. The proponents will select specific users to experience the use of the system. The actual steps to deploy the system include setting up the production environment, migrating any necessary data, and configuring the system for real-world use. The system will be installed on servers or distributed through a cloud platform, ensuring dependencies are properly configured. Training sessions will be conducted for the selected users to familiarize them with the system's features and functionalities. During the trial period, the proponents will closely monitor the system's performance and gather user feedback to identify any areas for improvement. This feedback will be used to make necessary adjustments before the full-scale roll-out.

Review. After the deployment of the system, there will be reviews from the selected users. These reviews will be considered by the proponents in order to redesign and redevelop the system.

Fig. 6. The Agile Model of the study.

Operational and Testing Procedures

The following are the procedures in operating the system:

1. Log in to the payroll system.

2. Familiarize yourself with the system's user interface and menu options.
3. Click “Dashboard” to view the details of the system.
4. Click “employee” to view the information of all employees status like Permanent, Contractual and job-order
5. Click “Add employee” to add new employee
6. Click “Search bar” to find the employee details.
7. Click “Employee name” to view records of employee like payslip and documents.
8. Click the add icon on documents to add document.
9. Click “print button” to print the payslip of an employee
10. Click “leave ” to view the leave history of all employee
11. Click “Search” to view all the leave history in the system
12. Click date picker to filter the leave on that date
13. Click “leave” dropdown button click the request button to view the leave request of the employee
14. Click search bar to identify which department have request leave
15. Click the green button to accept the leave request
16. Click the red button to decline the leave request
17. Click “Attendance” to view the daily log of all employees
18. Click add attendance to add attendance of the employee
19. Click “export” to export the file of the attendance in daily log
20. Click “Filter Date” to filter all employee attendance details.
21. Click “wayge payroll” to add the name of employee and view wage payroll
22. Click the button “action” to add name of the employees

23. Click “summary wage” to view the summary payroll
24. Click the button “action” to edit the info in summary wage
25. Click “print” button to print the summary wage.
26. Click “setting” to edit the general info about office
27. Click “payslip” view and print the payslip report
28. Click “Log out” to exit the system

Testing Procedures:

The system was tested in the following environment to achieve maximum performance.

1. Functionality testing in operating system of Windows 10 or 11.
2. Compatibility testing using different Android system.
3. Compatibility testing with various screen displays.
4. Functionality testing with the memory of 2GB, 4GB and 8GB above sizes.
5. Functionality testing with hardware device such as printer and scanner.

Evaluation Procedures

1. Preliminary Evaluation
 - a. Preliminary evaluation of the researchers on the expected output will be conducted
2. Project Demonstration
 - a. The proponents randomly select 12 respondents composed of five (5) employees, two (2) appointed HR Staff, and five (5) IT experts, who

were invited to evaluate the system through the use of printed forms as an evaluation tool.

- b. Presented the system.
- c. The researchers asked the invited respondents to operate the system and observe the performance.

3. Final Evaluation

- a. The evaluation instruments were distributed among 12 respondents.
- b. The researchers asked the respondents to rate the system based on the criteria of the evaluation instrument and asked them to provide their comments, suggestions and recommendations using the five-point Likert scale presented in Table 1.

4. Statistical Treatment

- a. The researchers collected the graded evaluation instruments from the respondents.
- b. The researchers tabulated, calculated, and interpreted the results from the graded evaluation instruments.

Table 1 shows the five Likert scale used in tabulating and interpreting the results of the evaluation. It showed that the highest is five which describes “excellent” rating and lowest is one which describes “poor” rating.

Table 1. The five-point Likert scale.

Scale	Descriptive Rating	Range Distribution
5	Excellent	4.51 - 5.00
4	Very Good	3.51 - 4.50
3	Good	2.51 – 3.50
2	Fair	1.51 – 2.50
1	Poor	1.00 – 1.50

Legends: 0.50-1.50-Poor, 1.51-2.50-Fair, 2.51-3.50-Good, 3.51-4.50-Very Good, 4.51-5.00-Excellent.

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