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Cv avero employee payment transformation: website-based information system design for optimal efficiency

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ABSTRACT

In an endeavor to enhance operational efficiency and stay abreast of swift business advancements, CV. Avero Indonesia recognized the imperative to integrate information technology into its payroll system. Presently, the company relies on partially computerized methods employing Microsoft Excel and Microsoft Word for managing attendance records, generating payroll reports, and issuing pay slips. However, this approach introduces constraints such as manual salary calculations, computation of team and individual bonuses, overtime pay, and the generation of reports. To address this challenge, the objective of this research is to develop an integrated payroll information system based on a website platform. Following the waterfall method, the research encompasses phases such as definition, requirements analysis, system design, implementation, and testing. The outcome is a payroll information system equipped with features including division management, position tracking, employee data management, attendance recapitulation, overtime tracking, individual and team target setting, as well as comprehensive salary reports, attendance records, overtime details, and pay slips. This system aims to minimize reliance on Microsoft Excel, thereby augmenting operational efficiency and facilitating better control over employee performance. Furthermore, the data processed through this system can be utilized for future company development, ensuring data integrity, and supporting the rapid growth of the business. Through the implementation of this innovative solution, CV. Avero Indonesia positions itself to sustain competitiveness and success within a dynamic business environment.

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1. INTRODUCTION

As the company expands its operations, it is imperative for the management to enhance effectiveness and efficiency in the execution of corporate activities (Langi et al., 2019; Salah et al., 2023). The competitiveness of the business world is impacted by diverse factors, encompassing the human element (human resources) and the operational systems employed. Human resources, often a pivotal factor influencing the company's profitability, should be the primary focus (Agustian et al., 2023; Dwivedi et al., 2021). Consequently, effective cost control in employee salary and wage payments is imperative, requiring consistent attention from the company. It is at the management level that the responsibility lies for overseeing and managing these costs (Irfan et al., 2021; Vinastri et al., 2019).

One essential component is the payroll system, playing a crucial role in the execution of the company's operational functions. In this context, two key stakeholders with a vested interest in overseeing company operations are the management and individual employees (Elsan Mansaray, 2019; Lu, 2023). Effective employee payroll administration has emerged as a pivotal component for the success of any firm (Rosmanida et al., 2022; Sypniewska et al., 2023). Due to the swift advancement of technology, organizations are increasingly leveraging internet-based applications to improve the efficiency of managing payroll procedures (Allioui & Mourdi, 2023; Le Barbanchon et al., 2019).

An Employee Payroll Application refers to a software or computer system organizations employ to administer and mechanize compensating their workforce effectively (Barrios et al., 2020; Garde et al., 2018; Gunawan & Sutomo, 2023). Web-based payroll systems are designed to replace manual calculations and spredsheet usage, leading to fewer errors and more efficient salary slip generation (Ahmed et al., 2023; Ahyar et al., 2020; Frantika et al., 2023; Slamet Riyadi No, 2020; Zainullah et al., 2021). The purpose of this application is to support organizations in managing employee salary information, encompassing wage calculations, deductions, and the administration of many compensation elements (Hasti et al., 2020; M irsyan antony manday & Amanda Putri, 2023; Xie, 2023).

Operating in the bodycare sector, CV. Avero Indonesia is a small and medium-sized enterprise (SME) that offers a diverse range of head-to-toe body care products. The company is staffed with several employees distributed across various divisions, each contributing to their respective fields. Over the years, CV. Avero Indonesia has experienced significant growth in its business development.

As the business expands, the demand for resources, particularly human resources in the form of employees, is also on the rise. Currently, CV. Avero Indonesia employs a semi-computerized method for its payroll system. This involves utilizing Microsoft Excel and Microsoft Word applications for tasks such as attendance recaps, payroll reports, and pay slip recaps. However, this method has its limitations, notably in the manual calculation of salaries for each employee, determining team and individual bonuses, calculating overtime pay, and generating reports.

The reason for undertaking this research stems from a pressing need for an advanced, technology-driven solution to address the payroll challenges faced by the organization. Leveraging web-based applications enables the creation of a cohesive and user-friendly platform, streamlining the entire payroll process. Adopting this approach not only reduces the likelihood of errors in calculations but also provides a swift and reliable method for salary distribution. Moreover, the system has been meticulously designed to integrate state-of-the-art security protocols, safeguarding confidential employee information and minimizing potential risks associated with data breaches or unauthorized access.

Several researchers have conducted research on payroll information systems, such as research conducted by Hikmah and Muqorobin (2020) developed an employee payroll information system for Consulting Engineering Services company. Tey aimed to eliminate the challenges of manual payroll calculation. Tey conducted research through observation, interviews, documentation, and literature review, and used PHP and MySQL database to build the system. Te design improved payroll management and provided faster and easier retrieval of employee payroll information, leading to improved administrative processing efciency (Hikmah & Muqorobin, 2020).

According to Mahardika & Siregar (2019) a private university supervised by a Foundation, has implemented various information systems across different work areas. However, the payroll process for employees is still manually conducted and has not transitioned to a computerized system. This manual process includes tasks such as attendance recap, wage recapitulation (including additional salary to basic salary), and calculating the overall salary received by employees. Consequently, the current payroll system is deemed less effective and efficient (Mahardika & Siregar, 2019).

According to Siswanto & Rosyani (2021) the employee payroll system, considered the most crucial in a company, relies on real data collection to ensure accurate administration. At the Blitar Building Shop, a provider of building tools and materials, the current payroll process is manual, leading to inefficiencies in time utilization. In response, the author of this research proposes the design of an Employee Payroll Information System application.

The transition to a web-based payroll information system offers numerous advantages for CV Avero Indonesia, including improved accessibility, streamlined processes, and enhanced data management. However, this shift also presents potential risks that need to be carefully considered. One of the primary risks involves data security; storing sensitive payroll and employee information on a web-based platform increases the vulnerability to cyberattacks and unauthorized access. To mitigate this risk, robust security measures such as encryption, secure authentication protocols, and regular security audits will be implemented. Another potential risk is system downtime, which could disrupt payroll processing and other critical HR functions. To address this, the system will be designed with high availability and redundancy features, and a reliable technical support team will be established to provide prompt issue resolution.

Additionally, an in-depth needs analysis was conducted to thoroughly identify the functional and non-functional requirements of the system. This analysis involved gathering input from various stakeholders, including HR personnel, management, and employees, to ensure the system meets the diverse needs of its users. Functional requirements such as payroll calculation, attendance tracking, and report generation were identified, along with non-functional requirements including system performance, user interface design, and security standards. By comprehensively understanding these requirements, the development team was able to design a system that not only fulfills current organizational needs but also has the flexibility to adapt to future changes and enhancements.

Given the outlined problem, there is a need to create a computerized employee payroll information system on a web-based platform, leveraging internet technology for easy accessibility. To align with substantial business expansion, the development of an information system becomes imperative to facilitate efficient employee data management. An integral component of this information system is the establishment of an integrated payroll system, aimed at minimizing reliance on Ms Excel for employee data management. The implementation of an integrated payroll system enhances the efficiency and accuracy of employee salary data management. Additionally, this system serves as a valuable source of information to support the accelerated growth of the business.

2. RESEARCH METHOD

This research adopts the waterfall method as the primary approach for developing an employee payroll information system. This method, known as the system development life cycle (SDLC), comprises specific steps to ensure that the stages of system development are executed in a structured and measurable manner.

The initial stage in developing a payroll information system involves problem identification. Interviews are conducted using a question-and-answer process with relevant parties at the Avero office. Following this, a literature study is conducted, which includes collecting data and documents from various sources such as books, articles, and news. The purpose of this literature study is to support the creation of the information system.

The second stage of developing a payroll information system involves software development using the waterfall SDLC method. It encompasses planning and designing a payroll information system through the analysis of software and hardware requirements that will be employed in the design process. Subsequently, during the design phase, researchers employ the Unified Modeling Language (UML), which includes use case diagrams, activity diagrams, class diagrams, and sequence diagrams. The interface design is executed using Balsamiq Mockup.

After designing the diagrams and interface, the subsequent stage involves constructing an information system based on the developed design. This is achieved by utilizing the PHP, HTML, and CSS programming languages, incorporating the Bootstrap framework and CodeIgniter. Following the development phase, testing is conducted using the black box method to verify whether the application's outcomes align with the intended design.

After the implementation of the payroll information system, system maintenance and support will be managed through a comprehensive plan to ensure the system remains functional, efficient, and up-to-date. Regular maintenance schedules will be established to address any technical issues, perform necessary updates, and improve system features based on user feedback and evolving organizational needs. Additionally, a dedicated support team will be available to assist users with any problems or queries, providing timely and effective solutions. This team will also conduct training sessions for employees to ensure they are well-versed in using the system, fostering smooth integration into daily operations. By implementing these strategies, CV Avero Indonesia aims to maintain the reliability and effectiveness of the payroll information system, supporting ongoing organizational growth and employee satisfaction

3. RESULTS AND DISCUSSIONS

3.1 Analyze the problem

Based on interviews with the HRD at CV Avero Indonesia, the calculation of salaries and targets achieved by teams and individuals is currently done semi-computerized. This poses a challenge, especially with the increasing number of employees due to the rapid business growth of CV Avero Indonesia. The problem analysis will be detailed using the PIECES method.

Table 1. Problem Analysis using the PIECES method

PIECES	Results of Analysis of the Old System	Expected Results in the New System
Performance	1. Processing employee salary data using a semi-computerized system in the form of MS-Excel and MS-Word.	1. Employee salary data processing uses a computerized system in the form of a website-based information system. 2. The time used for reporting is

	2. It takes 1-2 days to do the report because you have to manually record the data	reduced to 1 day with the help of the information system
Information	1. The process of recording and recapitulating salaries still uses manual calculations so it is prone to errors. 2. The target recap process still uses memos so it is prone to being inaccurate.	1. The function of the recording and recording process has been provided by the system. 2. A special menu is provided for target recapitulation.
Economic	In the long term, special costs are required to pay the salaries of employees who make reports.	In the long term, budget savings will be obtained because there are no expenses for employees who make reports.
Control	1. There is potential for data manipulation. 2. Documents are easily accessible to unauthorized parties. 3. Documents and data regarding payroll are prone to being lost	1. Authentication of the system for minimal data manipulation. 2. Granting access rights to the payroll system. 3. Documents and data regarding payroll are stored on the server and database
Efficiency	1. Errors in recording targets and calculating salaries. 2. Ineffective time for the process of recording and calculating salaries	1. Can minimize human error. 2. The recording and calculation process is faster and more efficient.
Service	1. Giving targets to teams and individuals, not organized. 2. Recording team and individual targets is prone to mistakes 3. Unsystematic data	1. Organized team and individual target data provided. 2. Minimize errors in target recording. 3. Data is managed according to the input provided

Source: (Research Results, 2024)

3.2 Design

The design of this payroll information system utilizes the Unified Modeling Language (UML) as the modeling language for developing the information system. It encompasses the following key components:

a. Use Case Diagram

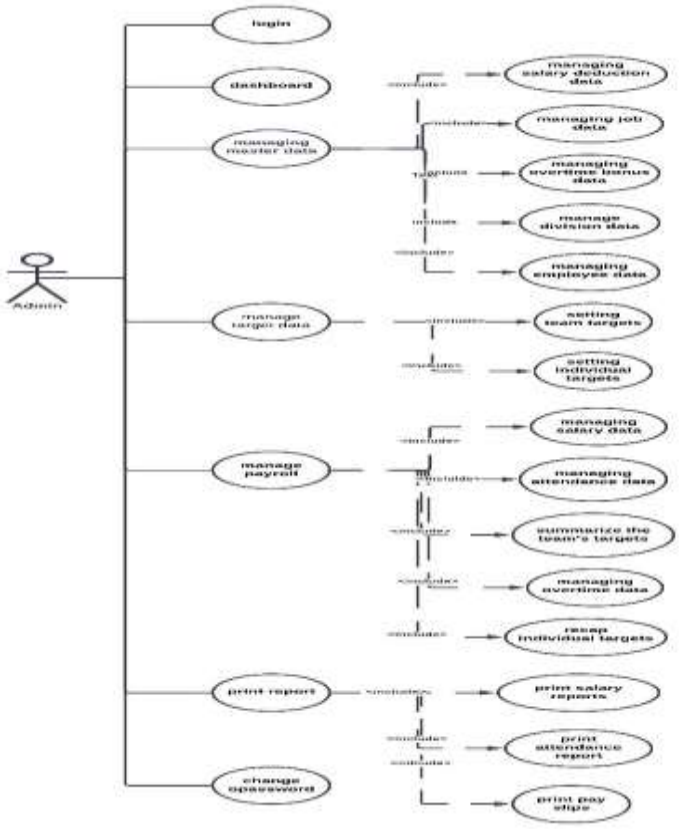

Figure 1. Use case

Use case diagrams describe an interaction between one or more actors and the system that will be created to find out what functions are in the system and who uses these functions.

b. Activity Diagram

Activity diagrams describe the sequence of process activities in a system, the following is the activity diagram in the employee payroll information system

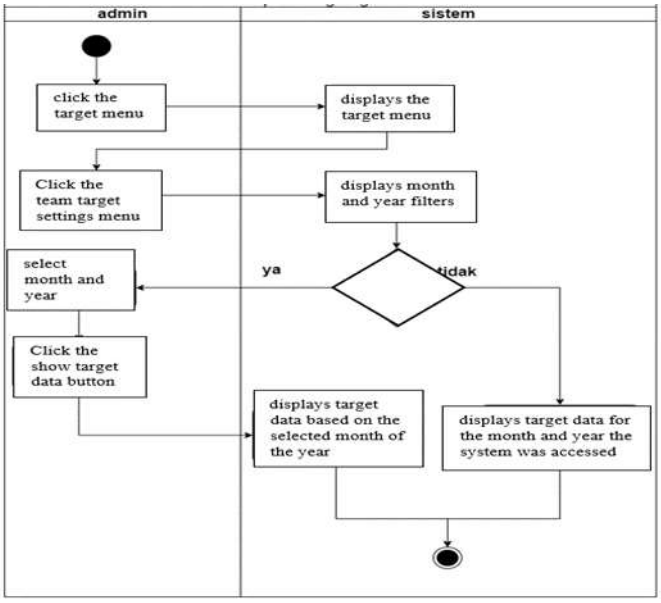

Figure 2. Activity diagram setting team targets

Figure 2 illustrates the process of displaying all existing target team data. Namely by pressing the target menu, then selecting team target settings. After selecting the team target setting, the system will display all existing team target data.

c. Desain

The user interface design for the website-based payroll information system at CV Avero Indonesia is developed using Balsamiq Mockup as the tool. The created user interface for this website-based payroll information system encompasses:

Figure 3. Plan to add team targets

In Figure 4, the user interface design for adding team targets comprises several components. These include page labels for adding team target data, labels, and text input for team task names, nominal labels and text input, implementation time labels, month labels and comboboxes, year labels and comboboxes, and division name labels with associated comboboxes. Additionally, there is a "save data" button.

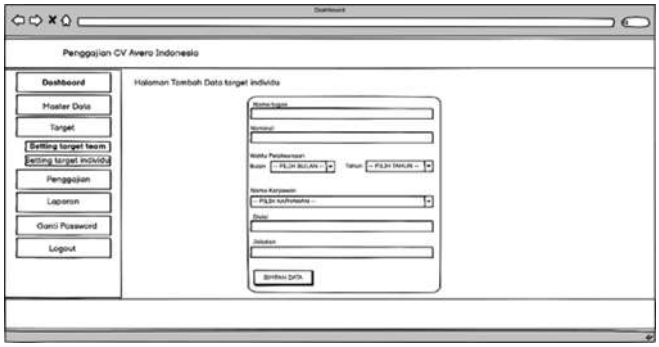

Figure 4. The plan adds individual targets

In Figure 5, the user interface design for adding individual targets encompasses various components. These include page labels for adding individual target data, labels and text input for task names, labels and nominal text input, implementation time labels, month labels and comboboxes, year labels and comboboxes, name labels and text input, division labels and position text input, and a "save data" button.

3.3 Implementation of the user interface

Once the design stage is completed, the subsequent step is to implement the design in coding form, utilizing the PHP programming language with the CodeIgniter framework. During this stage, the existing modules will be created and tailored to align with the previously developed design. The following provides a display of the implementation for the existing modules

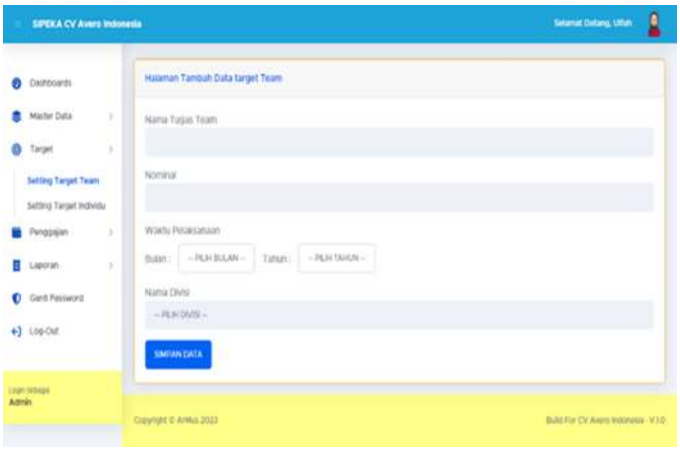

Figure 5. Team target data input display

3.4 Discussion

The primary objective of this study is the design and implementation of an information system for employee payroll. Web-based payroll systems are designed to replace manual calculations and spreadsheet usage, leading to fewer errors and more efficient salary slip generation. The Waterfall Method is frequently utilized for developing payroll systems, emphasizing a structured, step-by-step approach to system creation. Utilizing programming languages like PHP and databases such as MySQL is common for building payroll applications, facilitating data input and report compilation. This research complements research conducted by Hikmat & Muqorobin (2020) which states that there is a need for additional automatic attendance calculations for employees to be integrated by simplifying the calculation of employee salaries. Apart from that, other research only

creates an employee payroll information system without adding other features. Meanwhile, the information system that the researchers developed has several features such as division management, position management, employee data management, attendance recapitulation, overtime recapitulation, setting targets for individuals and teams, salary reports, attendance reports, overtime reports, printing employee pay slips. Apart from making the payroll process easier, this system can control employee performance. Payroll systems aim to automate various functions, including basic salary input, overtime calculation, deductions, and generating pay slips and reports, thereby enhancing administrative efficiency. The implementation of web-based payroll systems is expected to improve the accuracy of salary calculations and provide easier access to payroll data for administrators. User-friendly interfaces and the ease of modification are important features of these systems, allowing for adaptability to different organizational needs.

4. CONCLUSION

After undergoing a series of research processes commencing from problem identification, data collection, needs analysis and definition, system and software design, to the implementation and testing of the website-based payroll information system at CV Avero Indonesia, the information system developed facilitates the payroll process for CV Avero. It incorporates features such as division management, position management, employee data management, attendance recapitulation, overtime recapitulation, target setting for individuals and teams, salary reports, attendance reports, overtime reports, and the ability to print employee pay slips. Beyond streamlining the payroll process, this system enables the control of employee performance, maintains data integrity, and aligns with the rapid business development of CV Avero Indonesia.

The development of this payroll information system makes significant contributions to the field of payroll and HR management. By automating payroll processes, it reduces the likelihood of errors associated with manual calculations and spreadsheet usage, thus ensuring higher accuracy and efficiency. Furthermore, the system's comprehensive features support better management of employee data and performance, providing a structured approach to handling various HR functions. This research introduces several innovations and new approaches. Notably, it employs a web-based platform, which enhances accessibility and usability compared to traditional methods. The integration of features such as division and position management, attendance and overtime recapitulation, and individual and team target settings represents a significant advancement over existing systems that often focus solely on payroll calculations. Additionally, the use of the waterfall method in the system development life cycle ensures a structured and measurable approach to system creation, highlighting the importance of meticulous planning and design in the development of robust information systems.

For future research, it is hoped that additional features such as managing employee loans will be incorporated, and the information system can be seamlessly integrated with a fingerprint-based attendance system. This will further enhance the system's capabilities and offer even greater support for efficient HR management

REFERENCES

Agustian, K., Pohan, A., Zen, A., Wiwin, W., & Malik, A. J. (2023). Human Resource Management Strategies in Achieving Competitive Advantage in Business Administration. *Journal of Contemporary Administration and Management (ADMAN)*, *1*(2), 108–117. https://doi.org/10.61100/adman.v1i2.53

Ahmed, A. M., Mohammed, C. N., & Ahmad, A. M. (2023). Web-based payroll management system: design, implementation, and evaluation. *Journal of Electrical Systems and Information*

Technology, *10*(1). https://doi.org/10.1186/s43067-023-00082-5

Ahyar, H., Maret, U. S., Andriani, H., Sukmana, D. J., Mada, U. G., Hardani, S.Pd., M. S., Nur Hikmatul Auliya, G. C. B., Helmina Andriani, M. S., Fardani, R. A., Ustiawaty, J., Utami, E. F., Sukmana, D. J., & Istiqomah, R. R. (2020). *Buku Metode Penelitian Kualitatif & Kuantitatif* (Issue March).

Allioui, H., & Mourdi, Y. (2023). Exploring the Full Potentials of IoT for Better Financial Growth and Stability: A Comprehensive Survey. *Sensors*, *23*(19). https://doi.org/10.3390/s23198015

Barrios, J. M., Minnis, M., Minnis, W. C., & Sijthoff, J. (2020). Assessing the Payroll Protection Program: A Framework and Preliminary Results. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3600595

Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A. S., Kumar, V., Rahman, M. M., Raman, R., Rauschnabel, P. A., Rowley, J., Salo, J., Tran, G. A., & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, *59*(June 2020). https://doi.org/10.1016/j.ijinfomgt.2020.102168

Elsan Mansaray, H. (2019). The Role of Leadership Style in Organisational Change Management: A Literature Review. *Journal of Human Resource Management*, *7*(1), 18. https://doi.org/10.11648/j.jhrm.20190701.13

Frantika, S. Y., Ekasari, K., & Afandi, A. (2023). Modeling of Accounting Information Systems in Companies Implementing the Sharing Economy Business Model. *Indonesian Journal of Business Analytics*, *3*(5), 1527–1538. https://doi.org/10.55927/ijba.v3i5.5364

Garde, A. H., Hansen, J., Kolstad, H. A., Larsen, A. D., Pedersen, J., Petersen, J. D., & Hansen, Å. M. (2018). Payroll data based description of working hours in the Danish regions. *Chronobiology International*, *35*(6), 795–800. https://doi.org/10.1080/07420528.2018.1466797

Gunawan, M. J., & Sutomo, R. (2023). Web-Based Payroll Application Design and Development Using Rapid Application Development. *JOINS (Journal of Information System)*, *8*(1), 67–79. https://doi.org/10.33633/joins.v8i1.7979

Hasti, N., Dekiki, D., Gustiana, I., Wahyuni, W., & Hartono, T. (2020). Web-Based Honorary Teacher Payroll Information System. *IOP Conference Series: Materials Science and Engineering*, *879*(1). https://doi.org/10.1088/1757-899X/879/1/012021

Hikmah, I. N., & Muqorobin, M. (2020). Employee Payroll Information System On Company Web-Based Consultant Engineering Services. *International Journal of Computer and Information System (IJCIS)*, *1*(1), 27–30. https://doi.org/10.29040/ijcis.v1i2.11

Irfan, M., Khan, S. Z., Hassan, N., Hassan, M., Habib, M., Khan, S., & Khan, H. H. (2021). Role of project planning and project manager competencies on public sector project success. *Sustainability (Switzerland)*, *13*(3), 1–19. https://doi.org/10.3390/su13031421

Langi, B., Saerang, D. P. E., & Gerungai, N. Y. T. (2019). Analisis Sistem Informasi Akuntansi Penggajian Dan Pengupahan Dalam Upaya Pengendalian Internal Pada Pt. Gemilang Emas Indonesia. *Going Concern : Jurnal Riset Akuntansi*, *14*(1), 148–153. https://doi.org/10.32400/gc.14.1.22324.2019

Le Barbanchon, T., Rathelot, R., & Roulet, A. (2019). Unemployment insurance and reservation wages: Evidence from administrative data. *Journal of Public Economics*, *171*, 1–17. https://doi.org/10.1016/j.jpubeco.2017.05.002

Lu, S. (2023). An Analysis of the PayPals Corporate Strategy for Success. *Advances in Economics, Management and Political Sciences*, *24*(1), 93–97. https://doi.org/10.54254/2754-1169/24/20230421

M irsyan antony manday, I., & Amanda Putri, R. (2023). Designing A Web-Based Employee Payment Information System For The Nutritional Culture And Tourism Office. *Journal of Information Systems and Technology Research*, *2*(3), 141–151. https://doi.org/10.55537/jistr.v2i3.608

Mahardika, D. E. K., & Siregar, M. U. (2019). Design and Development of Web Based Employee Payroll Information System Using Codeigniter Framework and Extreme Programming Method. *IJID (International Journal on Informatics for Development)*, *7*(2), 1. https://doi.org/10.14421/ijid.2018.07201

Rosmanida, Yeni, C., Kurnia, E. D., Reskina, Ningsih, I., & Safrudin. (2022). The Effect of Salary Amount on Teachers' Performance. *Indonesian Journal of Multidisciplinary Science*, *2*(2), 500–505.

Salah, A., Çağlar, D., & Zoubi, K. (2023). The Impact of Production and Operations Management Practices in Improving Organizational Performance: The Mediating Role of Supply Chain Integration. *Sustainability*, *15*(20), 15140. https://doi.org/10.3390/su152015140

Slamet Riyadi No, J. (2020). Employee Payroll Information System On Company Web-Based Consultant Engineering Services 1 st Itsney Nur Hikmah, 2 nd Muqorobin 12 Institut Teknologi Bisnis AAS Indonesia Surakarta. *Internation Journal of Computer and Information System (IJCIS) Peer Reviewed-International Journal*, *01*(02), 2745–9659. https://ijcis.net/index.php/ijcis/index

Sypniewska, B., Baran, M., & Kłos, M. (2023). Work engagement and employee satisfaction in the practice of sustainable human resource management – based on the study of Polish employees. In *International Entrepreneurship and Management Journal* (Vol. 19, Issue 3). Springer US. https://doi.org/10.1007/s11365-023-00834-9

Vinastri, M. A., Morasa, J., & Pangerapan, S. (2019). Analisis Efektivitas Sistem Informasi Akuntansi Penggajian Karyawan Pada Pt. Kerismas Witikco Makmur Factory Bitung. *Going Concern : Jurnal Riset Akuntansi*, *14*(1), 181–186. https://doi.org/10.32400/gc.14.1.22474.2019

Xie, M. (2023). An Overall Analyses of PayPal. *BCP Business & Management*, *38*, 3250–3257. https://doi.org/10.54691/bcpbm.v38i.4277

Zainullah, Sani Supriyanto, A., & Siswanto. (2021). Pengaruh Word of Mouth Dan Promosi Terhadap Minat Menabung Anggota Di Ksps Bmt Ugt Sidogiri Cabang Pamekasan. *Jurnal Tabarru': Islamic Banking and Finance*, *4*(2), 317–326. https://doi.org/10.25299/jtb.2021.vol4(2).7419