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The System Design of Payroll Accounting Information System at Private Primary School in East Jakarta

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Abstract: This research aims to design a system design of payroll Accounting Information System (AIS) at a primary private school (Madrasah Ibtidaiyah Al-Baidlo/"MIAB"), East Jakarta to improve the efficiency of payroll business processes. Business Process Improvement was used as a design approach in this research, with an applied research type. Collect data by interview with Headmaster and Treasurer. The tool used to document business processes is the Bizagi Modeler. Automation is carried out to prevent human error and increase the processing speed of payroll business processes. The business processes that are designed will be tested by material and information technology experts. The result of this research is that the proposed (to-be) business process increases the simplification of payroll activities by improving the quality of fast and accurate decision making which has economic value. Using Business Process Modelling Notation allows this research to present proposed business processes related to needs and solutions to problems in the research objects observed. This research is proven to be able to increase the simplification of business processes, increase efficiency in decision making by school principals in a relatively short time from 337 minutes to 41 minutes or a time saving of around 296 minutes (equivalent to 4.93 hours).Cutting manual activities to automated processes increases the opportunity for fraud and human error.

Introduction

Organizations must adapt to technological advances in the fields of science and information technology, including educational institutions. Science and Technology (IPTEK) is a tool that can be optimized by educational institutions in carrying out their business processes. The resulting output can be used as a means of making management decisions, including managing payroll Accounting Information Systems (AIS). Payroll AIS design is directed at producing the use of accurate information to make the right decisions. Salary is financial compensation paid by employers to employees which is a form of money for employee contributions. Salaries are usually given in the form of monetary units or money and paid periodically, such as weekly, monthly or annually. Salaries are determined based on various factors, including the type of job, responsibilities, experience and skills of the employee, as well as company policies and industry standards. Workers also receive benefits, incentives, bonuses, and other compensation in addition to their base salary that can add to their total income. Salary is an important element in the employment relationship between employers and employees, and is often one of the main factors in employee job satisfaction and motivation.

Madrasah Ibtidaiyah Al-Baidlo ("MIAB") is an educational institution located in Lubang Buaya, Cipayung, East Jakarta. This educational institution received an Establishment Decree on March 26 2012 and was followed by an Operational Decree which was obtained on July 29 2016. In 2019, Madrasah Ibtidaiyah Al-Baidlo received an A accreditation based on an assessment from BAN-SM (National Accreditation Board for Schools/ Madrasas. Currently, Madrasah Ibtidaiyah Al-Baidlo has 30 teachers and educational staff with a total of 242 male students and 231 female students. For the new academic year 2024/2025, it is estimated that the number of students accepted is 500. The salary payment procedure for Madrasah Ibtidaiyah Al-Baidlo is still manual. This condition increases the probability of human error and fraud occurring. To make the payroll process more accurate, institutions are advised to implement a data computing system. Designing a payroll Accounting Information System (AIS) is an important factor that influences employee performance in terms of direct payment of salaries or wages.

The Head of the school stressed the pressing need for this system due to the absence of an automated payroll system, resulting in the manual execution of the payroll business process. Planning, monitoring and evaluation of reporting are still carried out directly between individuals. This process certainly has an impact on the lack of effectiveness and efficiency of financial administration activities at MIAB. This reinforced by several historical conditions that require special attention, such as difficulties in finding past financial data and less-than-optimal synchronization of financial information. This process causes the main problem namely the inefficient quality of financial administration. To design an adequate payroll accounting information system, it is necessary to design appropriate business processes. Based on this background, this research presents documentation of existing business processes and puts forward proposed business processes so that an apples-to-apples comparison made to increase the simplification and efficiency of the payroll business process

at the school. Several previous studies that strengthen the importance of an Accounting Information System (AIS) designed based on proper business process documentation based on a Business Process Management System are as follows. Similar research on payroll AIS can be used as a means of updating the system, reducing things that hinder the payroll process, increasing accuracy and reducing the risk of human error and fraud (Mufawizah, 2023; Yuliyanti, 2023). Other research emphasizes the importance of Human Resources (HR) in achieving organizational goals so that HR management is deemed necessary to receive attention. As a form of appreciation for worker dedication and triggering high productivity, a financial technology-based SIA payroll is important to design (Marzal et al., 2020; Nadhiroh, 2023; Saputra & Sufyana, 2023). Payroll SIA is designed to solve the problem of a weak internal control system (Meirini, 2023). Business process design must be designed adequately and pay close attention to process simplification and efficiency to produce relevant information for decision-making.

Business processes can be defined from various points of view, each of which considers certain aspects of the business process. For example, the general perspective is concerned with process activities, while the organizational perspective considers who performs the activities and where (Ismanto et al., 2020). The information perspective focuses on information entities, while the behavioral perspective determines when and how activities are performed. Therefore, based on the definitions given by several researchers, a business process can be considered as a collection of related tasks that are performed using various resources such as machines, software, humans, or other entities to carry out business operations that produce output that provides value to the organization (Utami, 2023). Based on the identification above, the basic concept of business processes can be illustrated as follows.

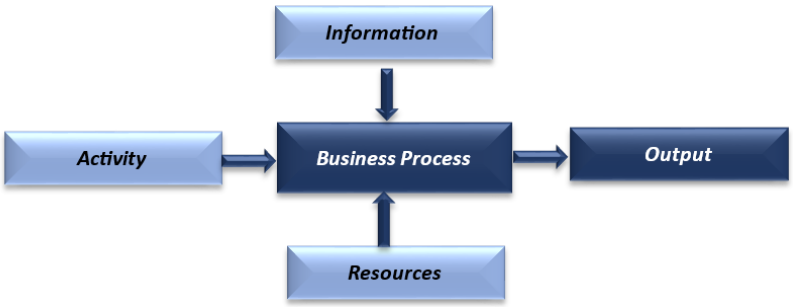

Figure 1. Concept of Business Process

Business processes can be identified by (Pratama et al., 2022):

1. Specific and identifiable input.
2. A set of tasks or activities that are clearly defined and carried out in a specific order.
3. Combining computing and human resources.
4. Specific results or output that provide specific value to customers.

Business Process Modeling Notation (BPMN) is a business process documentation modelling tool (Utami, 2023). Modelling that accommodates notational documentation for

defining business processes based on traditional flowchart techniques. The BPMN 2.0 specification also provides links between execution semantics, diagram notation, and other execution languages. BPMN is made so that it is easy to understand by various parties involved in the business process so that the communicative aspects can be conveyed (Ismanto et al., 2020). Thus, BPMN functions as a language that can be used together to overcome the differences that often occur in communication between business processes, design, and implementation. Process and task data processing can be done in two ways in BPMN, namely through data objects and properties. In the BPM environment, the de facto standard for modelling high-level descriptions of business processes is Business Process Modeling Notation (BPMN) (BPMN 2.0, 2011). Organizations use BPMN not only to provide descriptions of their business processes but also to analyze and improve the design and implementation of their business processes (Imron et al., 2023).

Proposed business process evaluation and improvement may be accomplished via the use of business process modelling. Businesses search for approaches to characterize business processes due to their intricacy (Fathah & Santoso, 2023). Research conducted at the PT ABC generator sets (Genset) facility revealed manufacturing process issues that need chaos and correcting. This study uses Business Process Modeling Notation (BPMN) as its methodology (Devianto & Haerudin, 2023). The new installation procedure at the recommendation stage is where the research's findings are found, and the processing speed for the examination of the suggested new business model design is 3250 minutes (Maulana, 2023). User-friendly notations help business users manage their operations efficiently, but they may also display complicated semantic processes in the field (Tampubolon & Situmorang, 2023). The study's findings led to the development of a stock inventory system that made use of Business Process Modelling Notation (BPMN) and additional features such as orders, return policies, product pricing, and enhancements to the existing system (Devianto & Haerudin, 2023). BPMN-based system design makes it easier for interested parties to read and understand workflows in certain industries. The use of BPMN increases the speed of decision-making for stakeholders if efficient procedures are needed for what they are currently doing. BPMN documentation allows users to mitigate potential errors that arise in carrying out business processes. There are two main types of business process models, namely (Tomu et al., 2024).

1. The basic "as-is" model is business process documentation that documents the existing situation.
2. The "to-be" model is a documentation of a proposed business process model to analyze, test, implement and improve the process.

This research has a major contribution in the field of payroll Accounting Information Systems where simplification of business processes is the main foundation in developing a more advanced product. The proposed (to-be) business process produced by this research meets the needs of the research object regarding how activities carried out more efficiently and answers the urgency of the problems faced, namely preventing and minimizing the potential for human error. Hypotheses not necessarily stated in this research, because this research is included in Research & Development. Thus, the results of this research put forward

a strong analysis regarding the problems and needs of the object observed. Based on these conditions, the problem formulation in this research is how to design an Accounting Information System (AIS) business process that can increase payroll efficiency at private primary schools in East Jakarta?

Research Method

This research is applied research (Research & Development). Applied research (Research & Development) can be intended to create a design or product design process, test and develop a product, and create a completely new product (Branch, 2020, p. 51). Additionally, the emphasis of this business process model of methodology is on recording planning flows, contracts, and work procedures. Additionally, it emphasizes the communication and cooperation between analysts and users, particularly how they function. In the concern to fulfil the demands of business process design (Anggraeni et al., 2023). This approach also emphasizes how analysts can react fast to user demands and how business process design may accomplish user goals and satisfaction (Luthfiani, 2024). In general, business process improvement places a strong emphasis on communication and teamwork between users and analysts (Mone et al., 2023). These qualities make it appropriate for short-term software development, teams that are less than 10 members, and the ability to adapt to new or changing customer requirements. According to Ekasari et al. (2019), interaction and cooperation with users will continue to adapt the information system designed to meet user demands. The stages of research or development that were completed include the following (Hardiana et al., 2023):

1. Need Analysis

   In this step, the demands of the Treasurer of the Madrasah Ibtidaiyah Al-Baidlo are analyzed as those of the user. Both primary and secondary data will be examined at this point. To comprehend the payroll mechanism, primary data was gathered through Focus Group Discussions (FGD) and interviews with the Treasurer. In the meanwhile, literature reviews were done to gather secondary data, and forms and policies about the business process were documented.
2. Planning and Design

   Using the Business Process Modeling Notation approach based on Business Process Management, the Planning and Design stage was completed to create a business process model design for payroll. According to Arofah & Cahyadi (2019), business process management is the umbrella term for strategies and tactics that assist in business process design, administration, configuration, and analysis. Through the implementation of Business Process Management methodologies, this study can pinpoint several actions that take place inside the company. Afterwards, this data may be utilized for analysis and field development (Ekasari et al.,2023). In general, human resources carry out organizational tasks by adhering to set policies and guidelines (Panduwinasari et al., 2021).
3. Development

The step of developing a business process model is the third research phase. The primary user's role as the treasurer is to offer recommendations for enhancement and assessment by relevant protocols and standards.

4. Conclusion

Testing the created business process model is the last step in the research process. The whole business process model's functioning may be deduced by the Treasurer. The system design will be tested by IT and material specialists to ensure that the suggested business process model is sufficiently reliable.

Sufficient data are required to support the accomplishment of study objectives. The data sources utilized in this study are separated into two groups, comprising there are primary and secondary sources. Primary data sources are those gathered via direct engagement with the study object. Interviews and the observation of study items provide primary data. The current payroll business process environment, including its associated parties and protocols, was the main focus of the observation operations. Particular attention was paid to the function or party that directly manages the payroll process throughout the interviews. Analysis of user needs is obtained through a primary data acquisition approach. Reports, books, scholarly papers, government statistics, journals, and internet databases are some of the sources of secondary data. By analyzing and interpreting already-existing data, secondary data can be used to comprehend a certain context, trend, or pattern without the requirement to gather brand-new field data. Secondary data used in this research includes form documentation, and a clear organizational structure along with duties, authority and responsibilities in connection with business process design. Next, literature reviews are conducted to enhance theoretical knowledge of payroll Accounting Information Systems (AIS) and documentation techniques are employed to gather the necessary secondary data (in the form of documents/forms used in processing current wages). The best research starts from existing problems and tries to solve them. Based on the background and description of the problems faced, the research object chosen was Madrasah Ibtidaiyah Al-Baidlo. This is because the research object in question requires a solution to problems and the need for simplification and efficiency of the payroll process in increasing transparency and accountability.

Result and Discussion

The analysis was based on information gathered from two (two) parties—the treasurer and the head of Madrasah Ibtidaiyah Al-Baidlo through interviews and paperwork. Payroll processing is the subject of the first analysis. The following are the business procedures and tasks involved in computing and reporting recitations. To determine the total number of working days for each teacher and member of the education staff, the school treasurer downloads the attendance recapitulation each month from the fingerprint attendance system. Teachers then supplied the attendance recapitulation over the WhatsApp group to get confirmation that the figure provided was appropriate. Manual confirmation is obtained by getting in touch with the school treasurer's personal WhatsApp number. The

treasurer utilizes the number of days as a multiplier variable for day variables like daily consumption and transportation to calculate remuneration based on the confirmation findings. The treasurer then uses Microsoft Office Excel to create a salary spending recapitulation report in a preset format.

To get the right nominal, calculations are done manually by multiplying variables. The monthly salary spending recapitulation report is calculated. The salary spending recapitulation report is printed and delivered to the Madrasah Head (Ka.), who is authorized to conduct an evaluation. The treasurer will amend, print, and submit a salary spending recapitulation report for additional scrutiny if Ka. Madrasahs discover that there is a mistake in the figures in any one of the cases. According to Ka. Madrasah, the school treasurer will proceed with creating salary slips by recalculating the nominal amounts mentioned in the salary spending recapitulation report if the report is deemed adequate. The recalculation is regarded as a method of double-checking and is meant to prevent mistakes based on information provided by the treasurer. The same program, Microsoft Office Excel, is used manually to create and calculate basic pay stubs. Pay slips are organized according to each page in an Excel file, separating them according to teachers and techniques. Teachers and staff get cash salary payments along with the produced and computed wage slip, which is subsequently printed. As an integral component of the salary spending recapitulation report, each teacher and staff member who has received a pay will sign a proof of salary receipt before archiving is completed. Based on the analysis of the activities carried out in the payroll process at MIAB above, documentation of existing (as-is) business processes can be presented as follows.

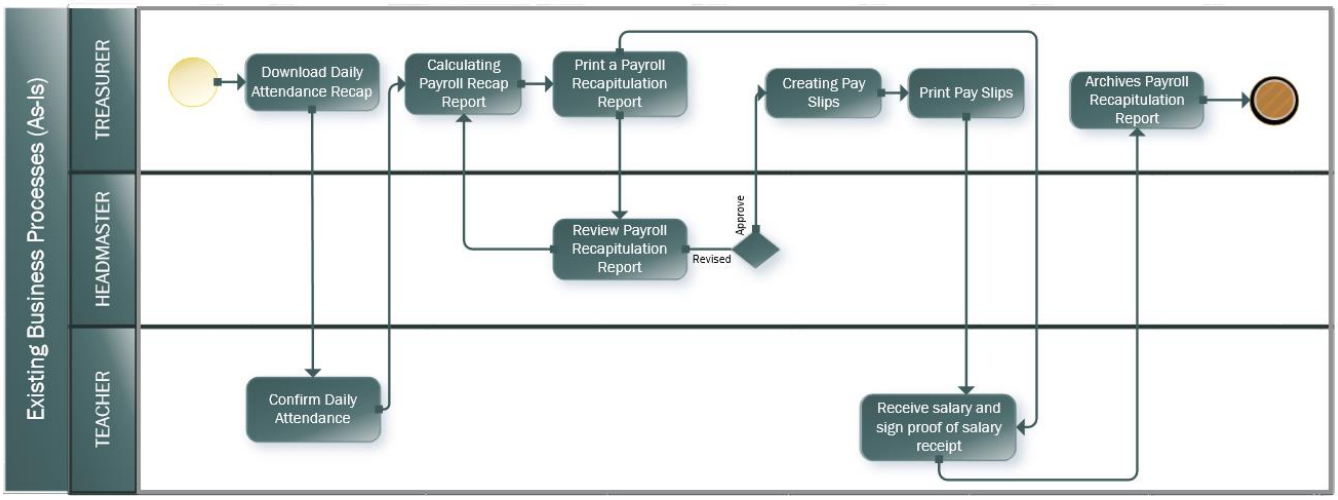

Figure 2. Existing Business Process (As-Is)

The following list of shortcomings pertains to MIAB's current payroll business procedure.

1. The treasurer provides an attendance recapitulation report that may be retrieved from the fingerprint attendance system via WhatsApp Group for manual confirmation of attendance. Teachers and staff can use personal WhatsApp to contact the treasurer to make revisions if they believe that the quantity of attendance stated is incorrect. The process's flaw is the possibility of human mistakes throughout the manual recapitulation

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and repair procedure when the advancements achieved are not followed up on. Thus, there's a chance of making mistakes or forgetting important fixes.

2. Manual calculations are used to prepare monthly salary spending recapitulation reports, with the results manually entered into a Microsoft Excel worksheet. This restriction arises from the lack of master data that would enable computations based on preset variables or salary components to be performed automatically. As a result, there is a chance of computation mistakes leading to differences in the salary obtained (underpayment or overpayment).
3. After computation, the salary spending recapitulation report is produced and delivered to Ka. Madrasah for inspection. This activity exhibits glaring inefficiencies. This is because the treasurer must reproduce the salary spending recapitulation report upon revision if Ka. The Madrasah discovers that the calculated values do not match, and so on until the report is approved by the Head Madrasah.
4. As a precaution against the treasurer's miscalculations, salary slips on a Microsoft Excel worksheet are manually adjusted. For every teacher and staff member, calculations are made one component at a time without relying on the relevant recapitulation report or master data (which in this instance is not yet fully owned). This repeating computation process streamlines company procedures while increasing inefficiencies. The proposed (to-be) business process will then be presented as a first step in improving and improvising the payroll business process and designing a payroll Accounting Information System (AIS) at MIAB, based on the weakness analysis of the current (as-is) business process mentioned above.

The following difficulties and deficiencies in the current (as-is) business process are addressed by the proposed (to-be) business process, which is developed on a system basis. The treasurer completes the master data for teachers and staff members concerning the characteristics needed for wage computations. Employee ID, Employee Name, Position, Position Allowances, Teaching Rates/Hours, Health Benefits, Social Funds, Consumption, Transportation, Work Period Incentives, Teacher Welfare Funds, Insurance, and Extracurriculars are the minimum list of master data that the treasurer must possess. Moreover, only provide the Employee ID when doing computations on pay slips and salary expenditure recapitulation reports.

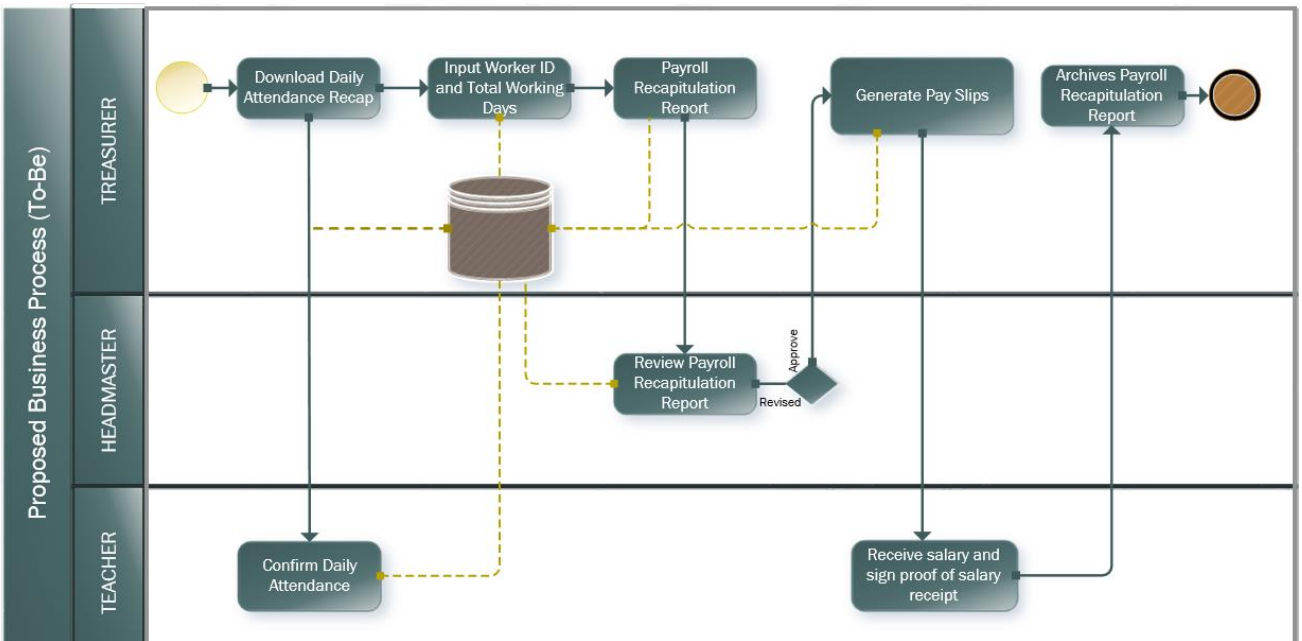

Figure 3. Proposed Business Process (To-Be)

In this proposed activity, the potential for human error as mentioned in point 2 regarding weaknesses in existing (as-is) business processes can be minimized. Next, the treasurer downloads the daily attendance recap from fingerprint attendance every month and inputs the number of attendances of each teacher and staff into the system. Next, teachers and staff who already have usernames and passwords independently check the system regarding attendance numbers. If the attendance number is correct, the teacher and staff can click the appropriate button. However, if it turns out that the number of attendance inputted by the treasurer still contains errors, teachers and staff can click the correction button and enter the correct number of days. In this activity, the inefficiency of the existing (as-is) business process at point A can be resolved. carry out independent checks on the system regarding the number of attendance. If the attendance number is correct, the teacher and staff can click the appropriate button. However, if it turns out that the number of attendance inputted by the treasurer still contains errors, teachers and staff can click the correction button and enter the correct number of days. In this activity, the inefficiency of the existing (as-is) business process at point 1 can be resolved.

Based on the number of attendances that have been reviewed by each teacher and staff by the treasurer, the calculation process and preparation of monthly salary expenditure reports can then be carried out using a primary key in the form of an Employee ID. This report can then be sent by the treasurer to Ka. Madrasas are to be reviewed by the system. When Ka. Madrasah has agreed and the report is considered correct, then you can click the approve button. On the other hand, if errors are found or certain changes are required at the behest of Ka. Madrasah, then you can click the revise button and fill in the notes to be submitted to the treasurer. This activity can further reduce inefficiencies and speed up the review process to close weaknesses in existing (as-is) business processes in point 3. Furthermore, salary slips can be generated based on the salary expenditure recapitulation report that has been approved by Ka. Madrasah. The treasurer can reduce activities that cause inefficiency and simplify business processes by recalculating salary slips based on the salary expenditure recapitulation report that has been prepared. This activity can also cover weaknesses in existing (as-is) business processes in point 4. Errors in financial information will be easily tracked and verified as quickly as possible, thereby improving the quality of financial information. As for the process of receiving salaries, the management of Madrasah Ibtidaiyah Al-Baidlo agreed to receive salaries in cash accompanied by printed pay slips. Simultaneously with receiving the salary, each teacher and staff signs the salary expenditure recapitulation report in the signature column.

In the proposed (to-be) business process, archiving can be done online where the signature on the salary receipt of each teacher and staff can be checked by the treasurer when receiving the salary. Printed documents can be archived manually based on the archiving method agreed upon by the management of MIAB. Other deliverables from designing a payroll Accounting Information System (AIS) include allowing Ka. Madrasah as a decision maker monitors critical aspects related to the attendance and payroll of its workforce which is presented in the form of an interactive dashboard visualization. It is hoped that the dashboard presented can become a decision-making tool for Ka. Madrasah appropriately, accurately and communicatively. This has implications for improving Ka's decision results. Madrasas in determining future economic policies and decisions.

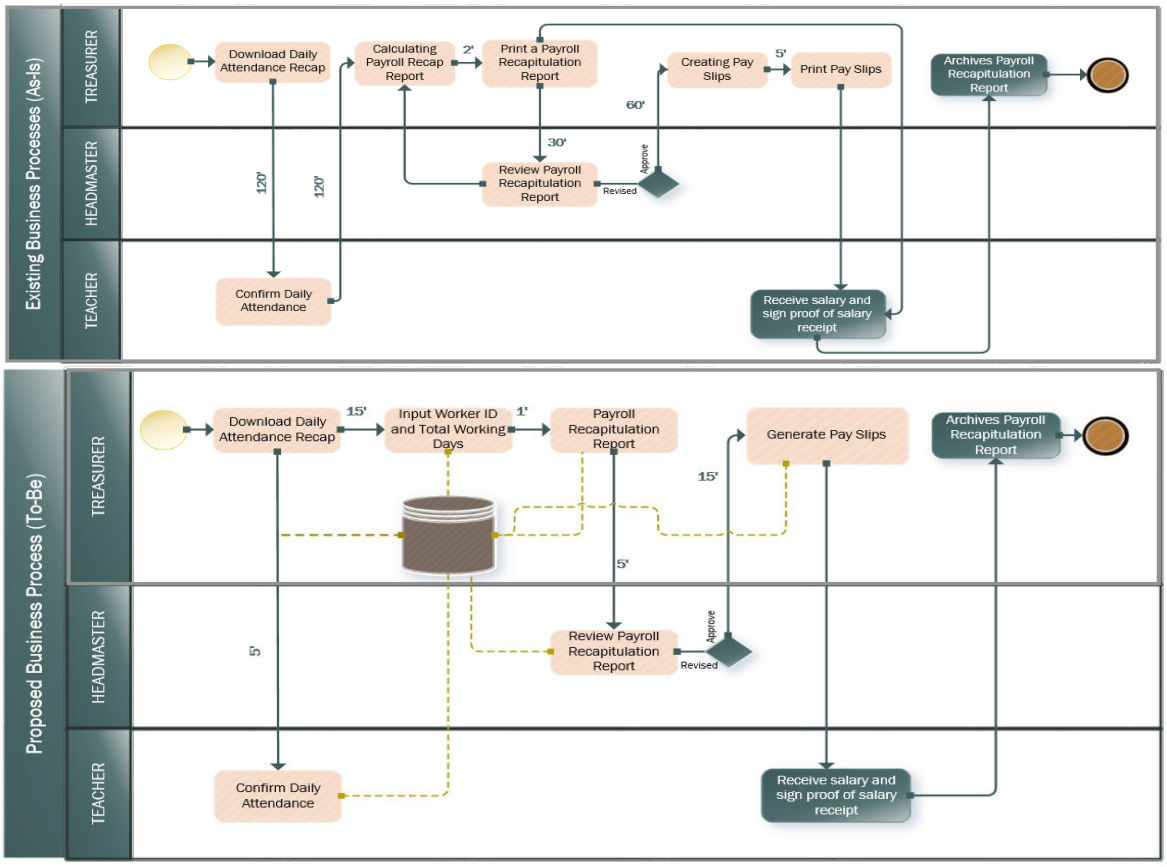

Figure 4. Business Process Simplification

Based on existing (as-is) business processes and proposed (to-be) business processes, a simplification process can be carried out for payroll Accounting Information System (AIS) activities which can be illustrated by the amount of time required to carry out these activities as follows. The time required to run the existing payroll Accounting Information System (AIS) business process once is 337 minutes or around 5.61 hours. Meanwhile, the efficiency of the proposed business process is achieved through a time reduction of around 296 minutes. So, the time required is only 41 minutes or 0.68 hours which can be detailed as follows.

Table 1. Comparasion of Time Efficiency

Activity	As-Is	To-Be
Confirm Daily Attendance	120’	5’
Calculating Payroll Recap Report	120’	
Input Worker ID and Total Working Days		15’
Print a Payroll Recapitulation Report	2’	
Review Payroll Recapitulation Report	30’	5’
Creating Pay Slips	60’	
Generate Pay Slips		15’
Print Pay Slips	5’	
Total	337’	41’

Time efficiency that can be cut significantly is in the daily attendance confirmation activity which was originally carried out offline using WhatsApp, the proposed (to-be) business process can be automated using the system. Teachers will get access as users in order to validate the number of attendance in the month concerned. Next, the treasurer will check and approve the amount that has been validated by each teacher.

Apart from that, reducing the process of making manual slips from 60 minutes to 15 minutes (time savings of around ¾ hour) and reducing the potential for human error is a simplification presented in the proposed (to-be) business process. This is because making pay slips in the existing (as-is) business process is still done manually one by one using Microsoft Office Excel.

Conclusion

Based on the research results above, the following points are as follows. Business process can be done using the Business Process Management System (BPMS) approach using Business Process Modeling Notation (BPMN). Designing the right proposed (to-be) business process can increase the efficiency of business activities that are carried out continuously and repeatedly. Existing business processes (as-is) and proposed business processes (to-be) must be able to document workflows that prioritize simplification. This is important as a step to achieve business process efficiency. The proposed (to-be) business process can be used as the main foundation for MIAB in designing a payroll Accounting Information System (AIS) to increase efficiency and simplify payroll activities. With a study related to the proposed (to-be) business process, MIAB can adopt it to increase work efficiency in the employee payroll process. So, the payroll process can run more quickly, precisely, accurately and relevantly as important information for interested parties in making decisions. Especially decisions in the future that have economic value.

This research has limitations that can be refined through further research or research by other parties. Further research can adapt the proposed (to-be) business process as a basis for designing a website or application-based automated accounting information system. Thus, the proposed (to-be) business process resulting from this research can become fundamentally strong. With the increasingly massive development of information technology, agencies must seize these opportunities to gain added value for their activities. Thus, the use of information technology, especially in connection with this research, namely the design of the payroll system at MIAB, it is hoped that the agency concerned understands the location

of activities in the business process can be simplified. Based on the research that has been carried out, it can be concluded that the results of this research have answered the problem formulation put forward, namely that the designed business process is able to increase the efficiency of the payroll process up to 87% $[(337' - 41') = \left(\frac{296'}{337'} \; x \; 100\right)]$.

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