

## Impact of ERP Implementation on Company Bottled Water to Performance Company

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### Abstract

This study evaluates the impact of implementing an Enterprise Resource Planning (ERP) system on the performance of CV Tirta Sasmita, a bottled drinking water producer. It addresses the challenge of fragmented business processes, hindering effectiveness and efficiency, along with suboptimal utilization of data resources. Qualitative methods, including interviews, observations, and document analysis, were employed. The study applied the ADDIE approach to tailor ERP systems to the company's needs and processes. The study yielded three significant findings. Firstly, researchers successfully developed a customized ERP system aligned with the company's requirements. Secondly, there was a tangible enhancement in CV Tirta Sasmita's financial performance, notably reflected in an increased total turnover asset ratio. Thirdly, employee performance exhibited improvements in work quantity, quality, punctuality, effectiveness, and independence. This research offers valuable insights for similar businesses or those considering ERP system implementation, highlighting its potential to enhance operational efficiency and performance.

**Keywords:** Information System, AMDK, ERP, Company Performance, *Total Turn Over Asset Ratio*

## Dampak Penerapan ERP pada Air Minum Dalam Kemasan Perusahaan terhadap Kinerja Perusahaan

### Abstrak

Studi ini bertujuan untuk meninjau dampak penerapan ERP terhadap kinerja perusahaan CV. Tirta Sasmita yang memproduksi air minum dalam kemasan. Penelitian ini berawal dari permasalahan proses bisnis yang belum terintegrasi sehingga efektivitas dan efisiensi proses bisnis belum tercipta. Permasalahan tersebut memberikan dampak pada pemanfaatan sumber daya data dan informasi yang belum optimal untuk mendukung kinerja organisasi. Lebih lanjut, studi ini mempertimbangkan teknik kualitatif melalui wawancara, observasi, dan studi dokumen. Kemudian, studi ini mengadopsi pendekatan ADDIE untuk mengembangkan sistem ERP sesuai dengan kebutuhan dan proses bisnis perusahaan. Hasil penelitian menunjukkan bahwa pertama, peneliti berhasil mengembangkan sistem ERP sesuai kebutuhan dan proses bisnis perusahaan. Kedua, studi ini membuktikan kenaikan kinerja keuangan dari CV Tirta Sasmita melalui peningkatan *total turn over asset ratio*. Ketiga, penelitian ini menunjukkan peningkatan kinerja karyawan dari aspek kuantitas kerja, kualitas kerja, ketepatan waktu, efektivitas, dan kemandirian.

**Kata kunci:** Sistem Informasi, AMDK, ERP, Kinerja Perusahaan, *Total Turn Over Asset Ratio*

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## INTRODUCTION

Information technology is a device used to obtain information both internally and externally (Odintsova et al., 2013). This study marks the development of information technology as an impact of the growing era of globalization. Then, information technology has also made a very positive contribution to the Management Information System (SIM). Furthermore, SIM plays a major role for stakeholders in an organization or company for accountable decision-making (Sudjiman & Sudjiman, 2018).

CV. Tirta Sasmita is a manufacturing company that produces bottled drinking water. Business processes that run in the company are still limited to divisional and have not been able to integrate. Furthermore, this leads to the information-moving process taking a very long period and increases information asymmetry. The company also continues to employ a manual system, which makes the administrative process ineffective and time-consuming and requires a lot of human resources. As a result, management ought to anticipate an increase in operational costs. The use of a manual system in CV Tirta Sasmita slows down management's ability to make business decisions. This issue demonstrates that the business has not been able to make the best use of its data and information resources.

Digital-based management information systems can help companies to run their business more effectively and efficiently (Laudon & Laudon, 2012). Research conducted by Purba Sugumonrong (2017) explained that ERP systems are proven to provide convenience in doing work because ERP systems can generate (*generate*) financial statements automatically, making the decision-making process faster. An information system, including *Enterprise Resource Planning* (ERP) systems, is designed with user interfaces to provide useful information to support strategy, operations, management analysis and decision-making functions in an organization. The implementation of an ERP system affects users at different levels of the organization as it crosses all functional units. (Al-Sabri et al., 2018) in their research comparing several ERP systems explained that ERP can help management make decisions faster. ERP users involve top management and lower-level users in daily operations (Matende & Ogao, 2013).

According to Wicaksono et al. (2015), an efficient and effective business model in the industrial era 4.0 can be achieved with careful preparation of innovation. Forms of innovation in the implementation of information and communication technology such as ERP systems. The implementation of an ERP system is one of the keys to the success of creating an efficient and effective business model. In other words, the explanation indicates that the implementation of ERP in companies brings many benefits to creating a fit business model (Kurniawati et al., 2015). The ease of using ERP in running business processes has been proven by research conducted by Priskila et al. (2020), which has tested 57 managers from 36 companies in Indonesia who have implemented ERP systems. The study explained that based on user experience, ERP systems are useful and easy to use so that business models are created effectively and efficiently. The findings offer implications for managers to start paying attention to factors that can help improve company performance from a user perspective. When user performance increases, the company's intellectual capital will also increase.

To be able to get a further picture of the operational process, observations are made. The conservation process is carried out by interviews and observations in the CV. Tirta Sasmita and the results of observations that have been made can be concluded that CV. Tirta Sasmita needs an ERP system to manage its business processes. The lack of synergy of information on business processes in CV. Tirta Sasmita makes business processes inefficient. The creation of business process management through an ERP system is an alternative solution to solve the problems experienced by CV. Tirta Sasmita. Several studies that have been conducted on implementing ERP systems in a company such as Purba Sugumonrong (2017) and Putra et al. (2021) have not carried out further analysis of the success of its implementation. Meanwhile, research conducted by Rini and Febriani (2017) states that the implementation of ERP systems has a positive impact on company profitability as measured through *Net Profit Margin* (NPM). Then, this study notes that still has weaknesses, namely not considering the evaluation process of the ERP system developed. From the observations and explanations above, researchers want to know how implementing ERP impacts bottled water companies. Research like this needs to be done to find out the direct implementation of the ERP system and see the impact of implementing the ERP system. In addition, the assessment of aspects of financial performance and employee performance on the implementation of the ERP system needs to be seen as research conducted by Sopian (2020). Furthermore, this study reviews the success of ERP system development through company performance with financial and employee performance aspects.

## **Literature Review**

### **Management Information Systems And *Enterprise Resources Planning* (Erp)**

McLeod and Schell (2007) define a management information system (MIS) as a system that processes transactions (data) into computer-based information that provides information related to the condition of an organization needed by the *stakeholders* of an organization in making decisions in the form of report-based information per period and the form of data analysis. At this stage, generally, management information systems are separate and have not been integrated. In other words, the SIM is built based on the partial needs of each unit within the company.

Furthermore, *Enterprise Resource Planning System* (ERP) is a development concept of SIM provided by application service providers to provide capabilities to company *stakeholders* in order to manage company resources efficiently, effectively, and integrated. ERP will utilize computer-based data management that provides real-time information related to company conditions so as to support decision-making and problem-solving in the company (McLeod & Schell, 2007). According to Laudon and Laudon (2004), an ERP-based information system is a computer system that integrates business processes in the company from the production, finance, accounting, sales and distribution processes in a comprehensive system.

McLeod and Schell (2007) explained that the advantage of implementing an ERP-based management information system is the management of two environments in a

company, namely the virtual environment (data) and the physical environment (human resources, raw materials, production processes and money) so as to create a competitive advantage of the company consisting of three dimensions as follows.

1. Strategy advantages
2. Tactical advantage
3. Operational excellence

If these three advantages can be managed properly, the company will benefit from its *supply chain management* so that it can realize the *Just In Time* (JIT) concept. Furthermore, the JIT concept will provide advantages in the supply of production resources provided in a timely manner according to demand, thereby reducing operational costs and losses. Reducing costs and losses will create and provide more value to consumers so as to increase company profitability (Laudon & Laudon, 2004). This opinion is also supported by Bannister (2012) who said that the application of ERP is able to encourage the creation of a new product or service through cost efficiency so as to provide new added value and increase the value of the *product image* in the company's products or services. This is inseparable from the form of better company service to consumers. Furthermore, Laudon and Laudon (2004) also said in their book that there are six key activities in system development as follows.

- a. Business process analysis
- b. System design
  - 1) Structured methods
  - 2) object-based methods)
- c. Programming
- d. Testing
- e. Conversion
- f. Production

Then, Bannister (2012) elaborated that evaluating investment decisions in the IT field can be done through three stages of analysis as follows.

- a. Return on investment analysis
- b. Capital budgeting analysis
  - 1) *Payback period*
  - 2) *Net present value*
  - 3) *Internal rate of return*
  - 4) *Full return on investment*
  - 5) *Discounted return on investment*
- c. Analisis cost and benefit
  - 1) Productivity
  - 2) Increase in market share or sales
  - 3) Reduction in inventory costs (cost of debt or product damage due to prolonged stock waiting)

### **The Effect of ERP Implementation on the Company's Financial Performance**

The company in its operations makes financial statements that must be evaluated by management to be able to see the extent of the performance of a company. Petty et al. (2015) mentioned that to evaluate the performance of a company can use financial ratio analysis consisting of:

a. Analysis of the company's liquidity ratios

The fundamental of the company's liquidity analysis is to measure the extent to which existing assets in the company can be immediately converted into cash to finance the company's operating costs which can be measured by:

1. *Current ratio*
2. *Acid test ratio*
3. *Account receivable turnover ratio*
4. *Inventory turnover ratio*

b. Capital structure ratio analysis

The analysis is used to see the mix of capital sources owned by the company in terms of acquiring and managing its assets for the company's operational interests which can be measured by:

1. Debt ratio analysis
2. *Total asset turnover ratio (TATO)*

c. Profitability

The fundamental of profitability analysis is the extent to which the company can control costs and maximize its assets to generate sales value that can be measured from:

1. *Gross profit margin ratio*
2. *Return to asset ratio*
3. *Return to equity ratio*
4. *Market-to-book ratio*

This study marks the effect of ERP implementation on the company's financial performance through Erlely and T. Pontoh's (2022) research on 12 companies listed on the Indonesia Stock Exchange with the LQ-45 category that implemented ERP-based information systems from 2011 to 2020. The study found that ERP has a significant effect on the company's financial performance variables consisting of *return on assets (ROA)* and *debt to total assets (DAR)*. Furthermore, this ERP implementation variable can also increase the relationship between ROA and DAR variables to increase company value. The research conducted by Serhan and Hajj (2019) found that there is a significant influence on company performance for companies in Lebanon that implement ERP. The study also found that companies that do not implement ERP in Lebanon are constrained by a lack of knowledge of ERP. Research conducted by Putra et al. (2021) also found that in a sample of companies that implement ERP-based information systems, there is a significant relationship between increasing the organization's ability to utilize existing information to maximize the potential of its resources so as to improve company performance. Furthermore, research conducted by Parto et al. (2016) who conducted research on 79 ERP user companies in Iran explained that the results of research of companies that implement all ERP modules (financial

modules, raw material modules, sales and distribution modules, production modules, consumer service modules, and quality management modules) provide more benefits than companies with partial ERP modules.

### **The Effect of ERP Implementation on Employee Performance or HR**

HR performance is the result of the work of employees of an organization which can be assessed with certain units to be evaluated against the achievement of company targets (Robbins et al., 2014). A study conducted by Wicaksono et al. (2015) on factors that affect performance ability and innovation explains that cognitive, affective, and psychomotor abilities of workers are very attached to motivation. In this case, motivation is related to the willingness of workers to achieve the vision, mission, and goals of the company. Employee performance indicators according to Robbins et al. (2014) are as follows.

- a. Working quantity  
The quantity of work that can be completed within a certain period of time.
- b. Quality of work  
The standard of quality of work produced by employees is compared to the company's quality target
- c. Timeliness  
The achievement of completing the tasks that have been given in accordance with the agreed time becomes the target at the beginning
- d. Effectiveness  
Measure how effectively an employee uses company assets to do work and produce results.
- e. Independence  
How far is the independence and initiative of employees in completing their tasks?

This study shows that the effect of ERP implementation on employee performance can be reflected through research by Hafifah et al. (2019) on 100 respondents in companies that use *the Application and Product System* (SAP). The research found that the fit between the type of task and the type of information technology can positively influence SAP implementation on employee performance. ERP can also increase the quantity and quality of employee work and increase employee knowledge with a clear division of tasks in the ERP system. The ERP system provides comprehensive and integrated information and in addition also facilitates work coordination between division employees so that employees can easily complete their tasks (Wicaksono et al., 2015).

## Research Conceptual Framework

The conceptual framework created in this study can be illustrated in Figure 1 below.

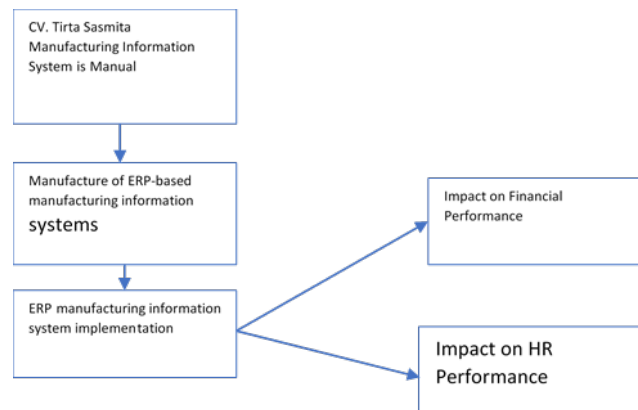


Figure 1. Research Conceptual Framework

## METHOD

This research is a case study research for ERP system development that is limited to the CV environment. Tirta Sasmita. According to Sekaran and Bougie (2016), case study research is research that naturally solves problems practically. In other words, a case study is qualitative research that aims to deal with problems in an object of research. Case studies emphasize problem-solving based on experience, how to handle problems in the past, and understanding the phenomenon of existing problems. Therefore, case studies can develop solutions and develop advanced theories empirically that serve as the basis for managerial decisions on similar problems. Furthermore, this study uses *the Analysis, Design, Development, Implementation, and Evaluation (ADDIE)* model in ERP system development (Alcid et al., 2017). Based on research conducted by (Spatioti et al., 2022) suggests that the ADDIE method can facilitate research studies from model planning to the detailed evaluation stage.

The study considers the five stages of ADDIE for ERP system development and performance appraisal as follows. First, analyze the problems that occur in the company to know and understand the subject matter. At this stage, researchers can formulate problems to find alternative solutions that are appropriate. The second step is data collection and development of ERP system design. The data used in this study are qualitative primary data and secondary data. Primary data collection techniques apply interview and observation techniques to department heads to staff on CVs. Tirta Sasmita. Then, secondary data is obtained from document studies, such as monthly financial statement documents for the period before and after the implementation of ERP-based applications, namely for May to July 2022 for the period before ERP implementation and September to November 2022 for the period after ERP implementation. Based on the results of interviews and observations, researchers found and developed an ERP system design in accordance with CV's business processes. Tirta Sasmita.

In the third step, researchers conduct web-based programming to realize the planned ERP system design. The stages of testing ERP system features have been carried out at this step before being implemented by users. After the development process ends, the researcher carries out the fourth stage. At this stage, researchers observe company performance through two criteria, namely: financial performance and employee performance. In the fifth step, researchers evaluate the implementation of the ERP system. The evaluation is carried out through changes in company performance that consider the *total asset turnover ratio* for aspects of financial performance. Then, aspects of employee performance are reviewed through the quantity of work, quality of work, punctuality, effectiveness, and independence (Andrianto, 2019). The steps in this study can be illustrated in Figure 2 below.

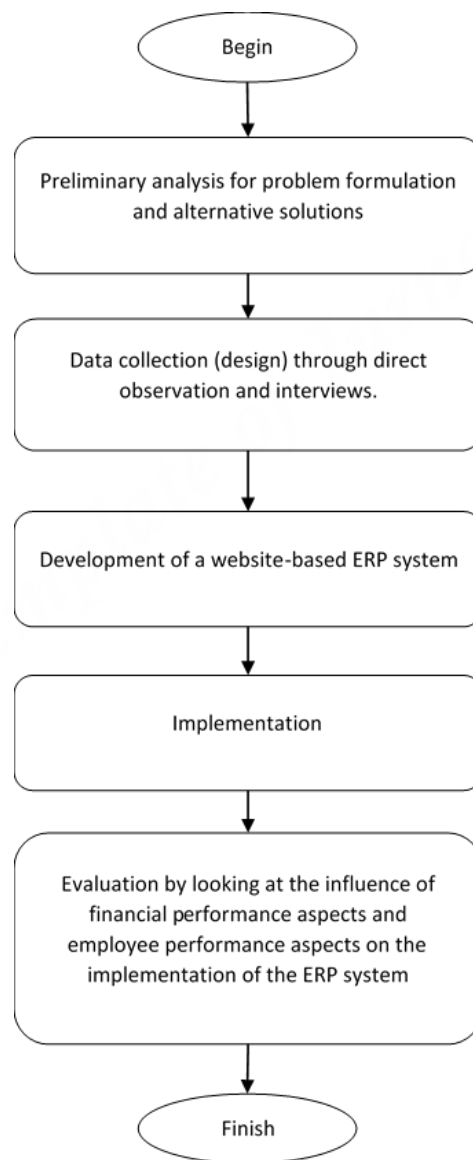


Figure 2. Stages of Research



## FINDING AND DISCUSSION

### Preliminary Analysis

The results of the research were obtained through the process of interviews with interested parties and direct observation. Based on these results, researchers managed to obtain an overview of business processes that occurred before the implementation of ERP systems as shown in Figure 3.

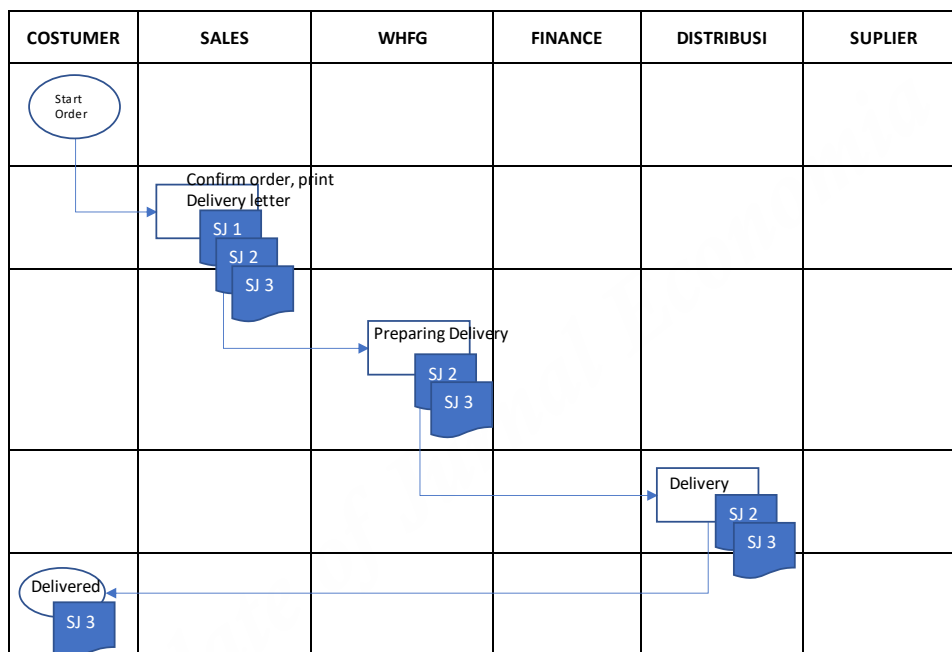


Figure 3. Initial Delivery SOP Flow

Figure 3 illustrates the business process of receiving and sending orders prior to the implementation of an ERP system. It appears that for order receipts, the only documents used are road letters that are not connected to other departments. In addition, the document is still in physical form so it has a greater risk of loss. Meanwhile, the production flow has no explanation or standard rules for scheduling and production orders so that production orders that run are only limited to verbal orders from the head of production alone. The flow of the production process can be seen as shown in Figure 4 below.

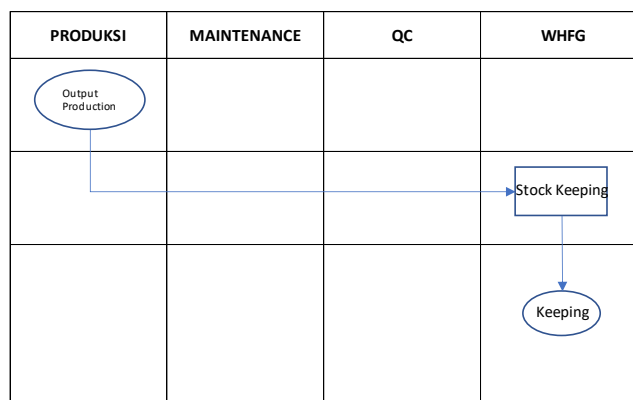


Figure 4. Initial Delivery SOP Flow

### System Design (Data Processing) and Development

The first stage carried out in data processing is to determine the *use case diagram*. *Use case diagrams* are used to facilitate the mapping of user roles in ERP systems, as stated in research conducted by Kurniawan and Syarifuddin (2020). ERP system that will be implemented in CV. Tirta Sasmita, where this ERP system can only be accessed by CV. Tirta Sasmita is a producer and can also be accessed by consumers to be able to see the history of orders and ongoing order conditions. This system is developed through a series of business process management based on data obtained by researchers. The results of the *use case diagram* design look like in Figure 5 below.

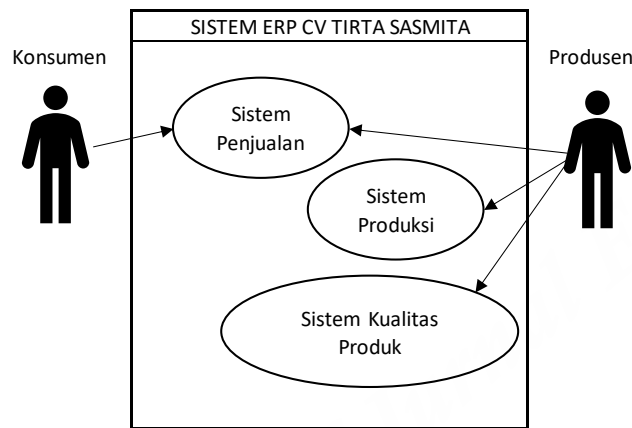


Figure 5. Production SOP Flow

After the *use case diagram* is formed, then the researcher designs the *activity diagram*. The design of the *Activity Diagram* is used by researchers as a basis for making logical process flows of ERP systems in their development. Furthermore, activity diagrams can make it easier to describe process flows from start to finish, even *activity diagrams* can illustrate process flows that run in parallel. This is in accordance with research conducted by (Yudowicitro & Yunitarini, 2014).

In its development, the formation of ERP system activity diagrams in CV. Tirta Sasmita starts from the flow of order receipt, production scheduling, the schedule for determining the delivery of goods to the receipt of materials, the purchase of materials for production the flow of receiving money, and the collection of sales receivables. CV Tirta Sasmita's Activity Diagram is contained in the SOP flow in Figure 6 to Figure 11 below.

### Implementation

The implementation stage in this study was carried out by implementing an ERP system in CV. Tirta Sasmita is accessed directly according to the needs of each department. The development of this module has been adjusted and reviewed at the analysis and design stages. In addition, before the direct implementation stage is carried out at CV Tirta Sasmita, users are given training first so that employees can understand the flow and procedures for operating the ERP system. Before the comprehensive implementation stage, a trial was carried out for 1 week to determine the performance of the ERP system

and to find out the direct experience of users, Figure 12 to Figure 17 presented the display of the ERP system developed.

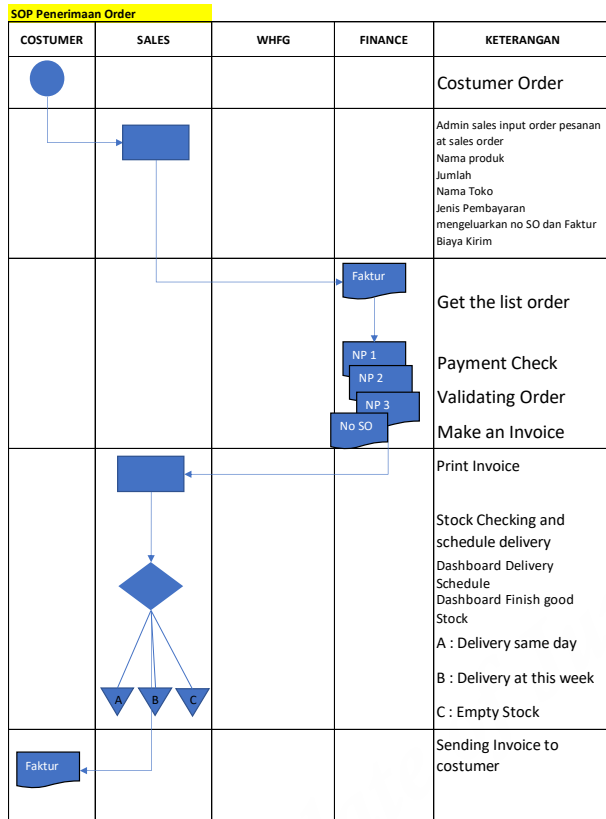


Figure 6. Production SOP Flow

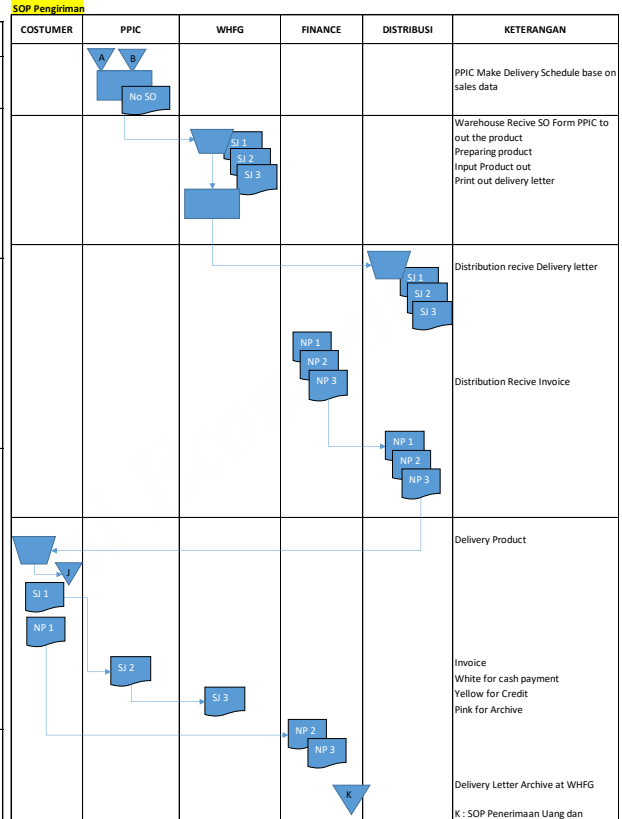


Figure 7. Product Delivery SOP Flow

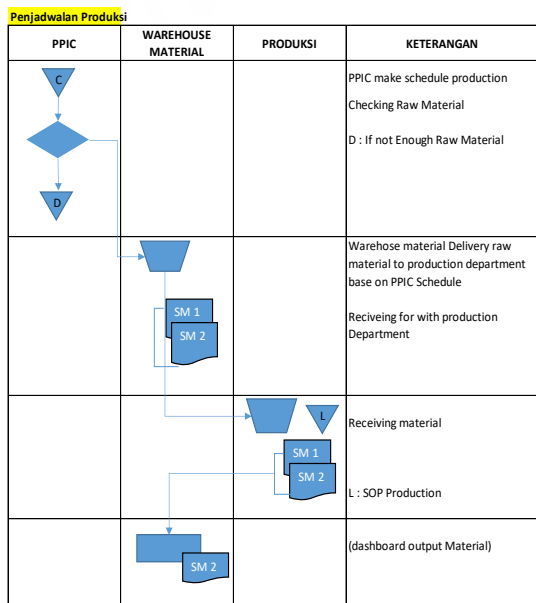


Figure 8. Flow SOP Scheduling

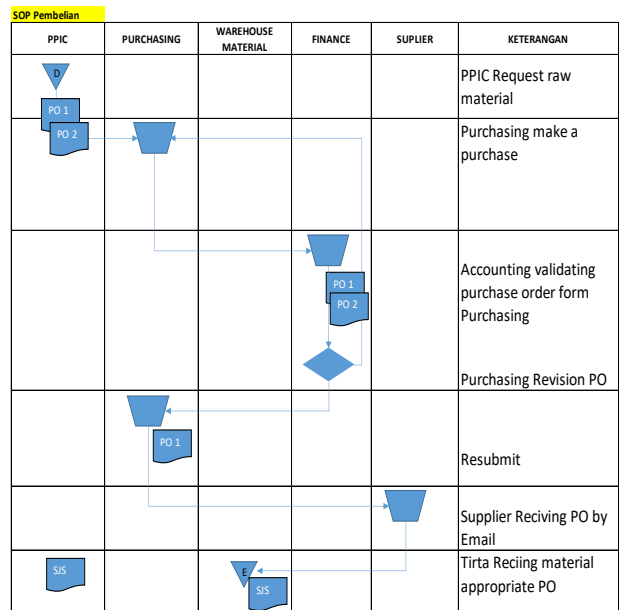


Figure 9. Purchase SOP Flow

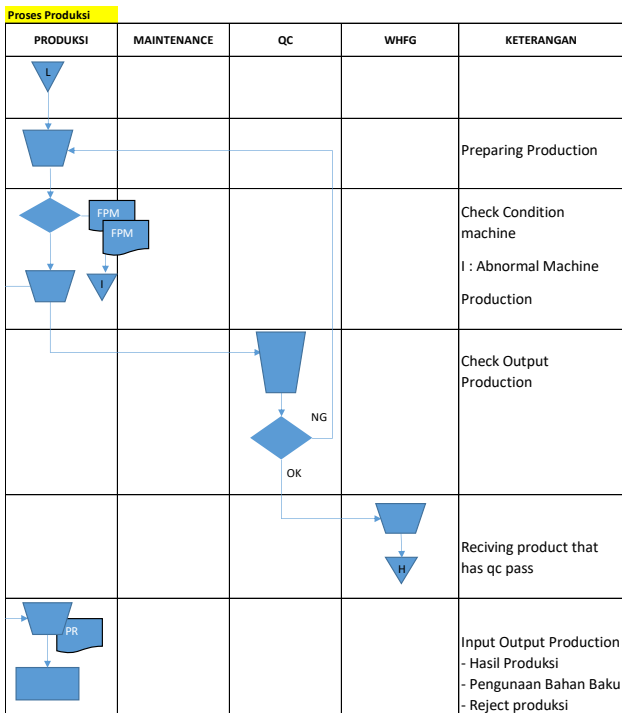


Figure 10. Production Process SOP Flow

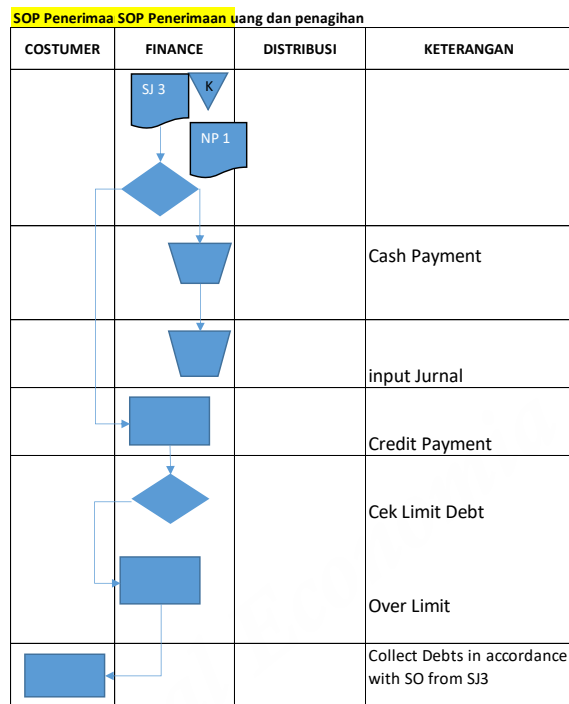


Figure 11. Flow SOP for Receipt and Billing

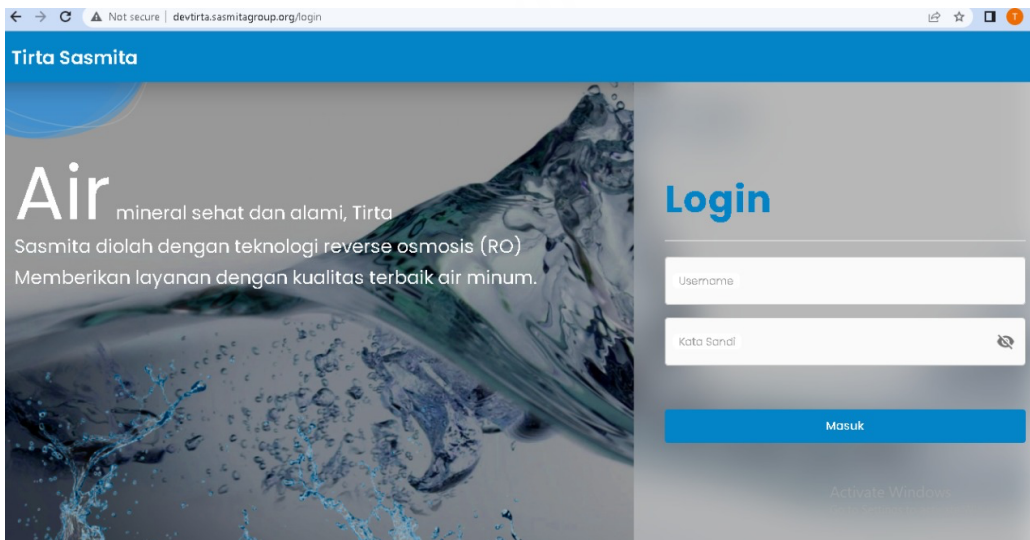


Figure 12. ERP Login Page

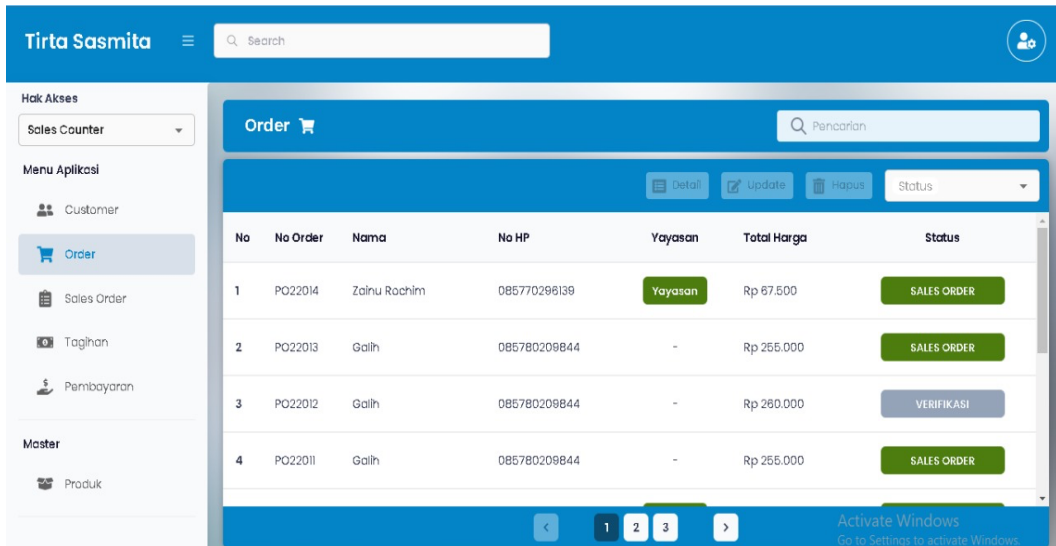


Figure 13.ERP Sales Page

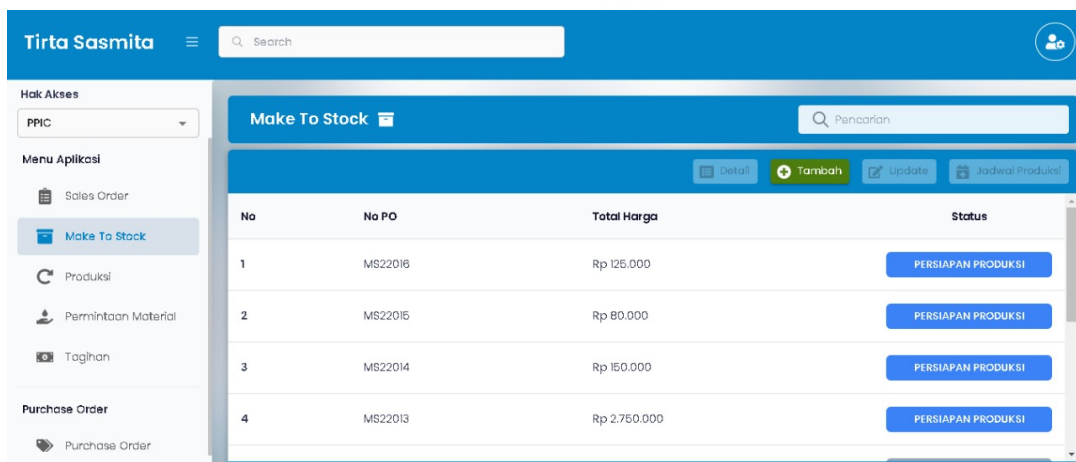


Figure 14. ERP Production Scheduling Page

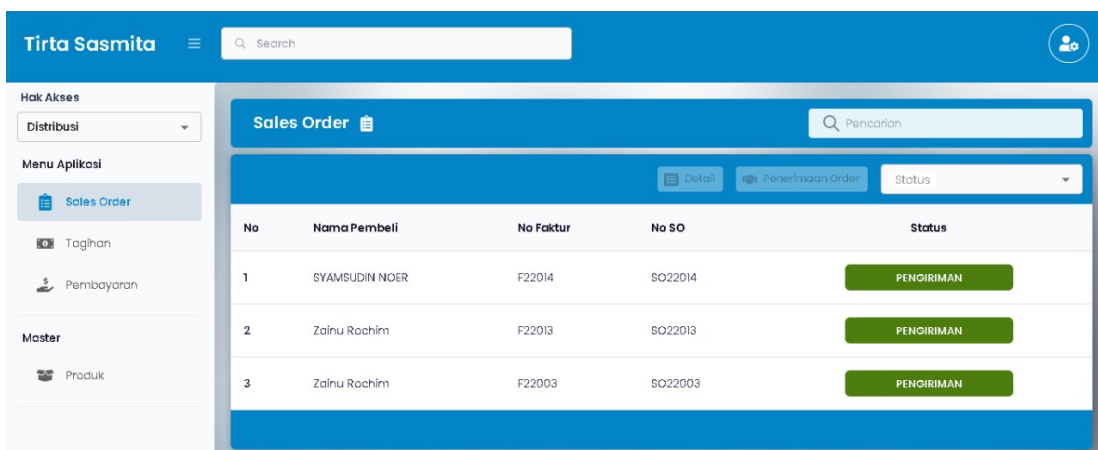


Figure 15. ERP Delivery Page

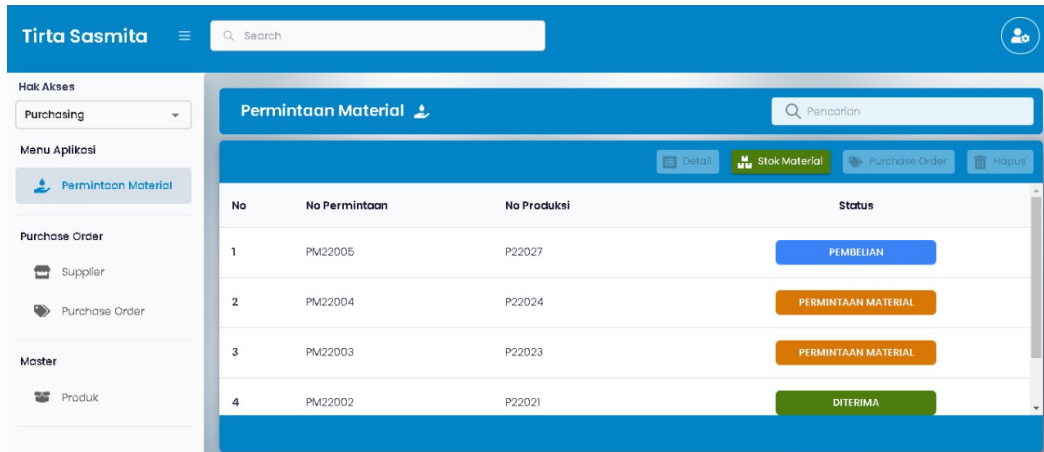


Figure 16. ERP Purchase Page

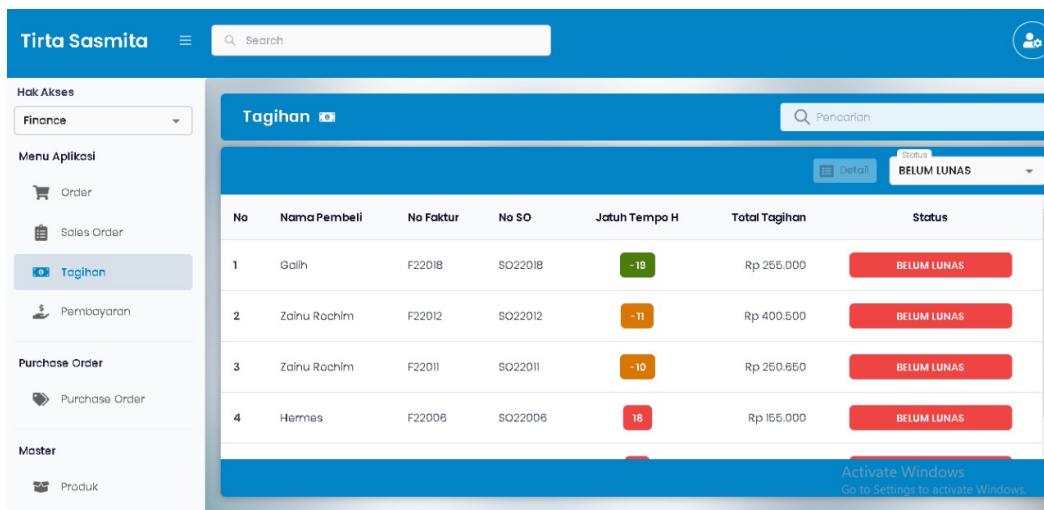


Figure 17. ERP Billing Page

### Evaluation

In the application of the ERP system in CV. Tirta Sasmita was tested for two weeks to test performance and durability. In the trial period, there were several inputs from direct users, namely on color displays only. In this study, there are two company performance indicators as a reference for evaluating the implementation of the ERP system in CV Tirta Sasmita, namely financial performance indicators seen from the value of its total *asset turnover ratio* (TATO) in the period before and after the implementation of the ERP-based system. Table 1 describes the comparison of financial performance before and after ERP system implementation.

Based on Table 1 data, it can be seen that after implementing an ERP-based system, the total *asset turnover ratio* (TOTA) value of CV. Tirta Sasmita has improved. This indicates that the implementation of the ERP system in CV. Tirta Sasmita can help companies improve their efficiency in managing assets to generate profit power in the company's operational cycle. Furthermore, ERP systems can improve the quality of information owned by CVs. Tirta Sasmita. This can be seen by the schedule for collecting receivables

before maturity to facilitate CV. Tirta Sasmita in managing cash flow. As a result, CV. Tirta Sasmita does not need to make loans to run its production cycle.

Table 1. *Financial Performance Comparison*

<b>Before ERP System Implementation</b>		
<b>Moon</b>	<b>Sales</b>	<b>Total Assets</b>
May	168.269.500	918.132.129
June	180.928.500	
July	150.156.750	847.572.295,47
Total sales	499.354.750	
Average Total Assets	882.852.212,35	
ALL	0,565615335	
<b>After ERP System Implementation</b>		
<b>Moon</b>	<b>Sales</b>	<b>Total Assets</b>
August	149.487.000	1.010.230.043
September	273.038.000	
October	373.038.000	963.978.338,07
Total sales	795.563.000	
Average Total Assets	987.104.191	
ALL	0,805956461	

Then, the company's performance appraisal is also reviewed through employee productivity (employee performance). Researchers review employee performance through five aspects as follows

a. Working quantity

Based on the interview results from resource persons who use this ERP system in CV. Tirta Sasmita obtained information that the ERP system helps them produce more work when compared to before using the ERP system. This is because by using an ERP system information is faster so that they can plan a job better and coordinate between divisions. In the end, they can get the job done faster. Previously, data sharing required time and complex coordination with related divisions. Excerpts of the interview are presented as follows.

*"... In our opinion, this system is very helpful in work, since inter-divisional information is obtained faster. Usually, we require complex and long coordination. Then, we can do better planning and get work done faster. ..."*

b. Quality of work

Based on the information of the resource person about the quality aspect of work, it is stated that their work has become more in accordance with policies, technical guidelines and standards set by the company. Basically, CV. Tirta Sasmita already has policies, technical instructions, and operational standards. However, because the work process is still manual and has not been connected between parts before the implementation of ERP, it is very difficult to control the quality of employee work.

For example, the formation of an inventory report on raw material inventory has invalid data due to the person in charge of the warehouse who is not orderly in filling out the report so when the production department wants to ask for goods for the production needs of the goods, the supply has run out. Furthermore, the implementation of ERP systems provides more valid inter-division report quality. Then, inter-divisional interaction and standardization of the format of the ERP system provide acceleration and ease in decision-making. Excerpts of the interview are presented as follows.

*“... Yes, basically operational standards, technical instructions, and policies already exist, but indeed our constraints are on inter-unit communication for the exchange of data and information. Actually, this is because there is no integrated system so a lot of data is not valid. ...”*

c. Timeliness

Based on the punctuality aspect, the resource person explained that the collection of data and the ease of obtaining information greatly support the timeliness of work completion. In other words, the creation of connectivity between divisions through the implementation of ERP has an impact on timeliness. Then, the implementation of the ERP system also supports employees in the production department which is explained through the following quote.

*“... This ERP system is very helpful for inventory prediction (raw materials) so that the provision of production raw materials is more timely and the production process is not hampered. Finally, companies do not need to increase capital from loans to buy stocks of raw materials. ...”*

The interview excerpt explains that the implementation of ERP can support the application of the *Just in Time* concept in CV's supply chain. Tirta Sasmita. Furthermore, the resource person in the production department also expressed an increase in punctuality in product delivery to consumers. This is considering the limited number of fleets for product distribution so that with scheduling effectiveness and efficiency can be realized.

d. Effectiveness

According to the source, through the implementation of an ERP-based system, the management of working capital and raw material inventory becomes more effective. This is because the provision of inventory is able to adjust the needs seen from the information in the ERP system. Furthermore, the information can be used as a basis for production schedules by considering sales needs. Furthermore, the management of accounts receivable becomes more effective because the finance department is able to control receivables due to maturity. Information connectivity between the finance department and the collection department provides a clear direction in the collection of receivables according to the age of receivables. This creates internal control related to credit sales carried out by the company to troubled consumers. Thus, the company's



operational risk can be reduced so that the company is able to operate more effectively. The effectiveness of production will create optimization of the utilization of limited company resources so that an increase in the company's profit power is created.

e. Independence

Through the implementation of the ERP system, the resource persons argued that the ERP system they used could have an impact on independence. In other words, the implementation of an ERP system makes employees more independent in completing their tasks because all the information needed and the format of the report being done are already available in the ERP system. This could reduce dependence on superiors for technical work with a standardized reporting format. In addition, the ERP system helps new employees understand business processes in the company faster.

## **CONCLUSION**

Re-emphasizing, this study aims to see the impact of ERP implementation on company performance from CV Tirta Sasmita. Furthermore, based on the results and discussion, this study draws the following conclusions.

1. Researchers have succeeded in developing and implementing ERP systems in accordance with the needs of business processes running on CV Tirta Sasmita. In other words, ERP systems are able to simplify administrative processes and integrate running process flows.
2. The ERP system has an impact on improving financial performance which is seen in the increase in TOTA value in the period after the implementation of the ERP system.
3. ERP systems improve employee performance in terms of work quantity, quality of work, punctuality, effectiveness, and independence.

In addition to the conclusions accomplished, the outcomes of the conducted research have the following implications:

1. It is anticipated that the findings of this research will assist comparable or other businesses in designing and implementing ERP systems in their respective business areas.
2. It is expected that testing will take longer in order to produce more desirable outcomes.
3. For other research, you can try to compare the results of using ERP with financial performance seen from the company's income statement.

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