Optimization Enterprise Resource Planning (ERP) system on the control flow of material in Kalijapat Warehouse

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Abstract. The warehouse is an area that has a function to store materials or production goods within a certain period which will then be distributed to the destination location. By implementing ERP (Enterprise Resource Planning) System can accelerate the control of material flow in the warehouse, reduce human error & can get data following the data in the field. However, the implementation of ERP (Enterprise Resource Planning) is also not easy and of course requires maximum preparation and techniques that must be perfect, so that the results are as desired. Therefore, in this study, we discussed the optimization of the ERP (Enterprise Resource Planning) System in controlling the flow of material in the Kalijapat Warehouse. This research was conducted using qualitative methods because it would explain in detail the process of controlling material flow during the implementation of an ERP (Enterprise Resource Planning) System in controlling the flow of material in the kalijapat warehouse.

1. Introduction

In the current era of globalization and industry 4.0, competition in the logistics sector is getting tougher, specifically companies that are engaged in logistics and have their own warehouse facilities, warehouses have several types, including raw material storage warehouses, semi-finished goods storage warehouses, production storage material warehouse, consolidated and transit central warehouse, transhipment center warehouse, cross-docking warehouse, central warehouse for sorting, fulfillment warehouse, reverse warehouse & public interest warehouse.

Warehouses play a critical intermediate role between supply chain members, affecting both supply chain costs and service [1]. Another consideration that must be taken is the flow of material concerning the amount of material and the distance of material displacement [2]. The activity of transferring materials is an activity that requires costs and influences the structure of production costs, so that planning, supervision, control, and repairs need to be done so that the objectives of the material transfer activities themselves can be achieved [3].

The minimum transfer distance will reduce the cost of moving goods so that it can reduce the total operational costs of the warehouse [4]. Warehouse as a special facility that is fixed in nature, designed to reach the target level of service with the lowest total cost. Warehouse management encompasses the control and optimization of complex warehouse and distribution processes [5]. Warehousing management designed to control warehousing activities expected from this control is the reduction of...
costs in the warehouse, effective and efficient collection and importation of goods into warehouses, as well as the ease and accuracy of the information on inventory in the warehouse [6].

Examples such as in aircraft sheds, products are placed randomly on floors without pallets, and operating performance depends largely on memory and operator experience, which results in more time and operating errors [7]. This problem is very likely to arise because the transfer of material in and out of the warehouse is not tracked in detail by the stored data. Warehouse operations no longer function as large stock storage; on the contrary, it has become an important activity in the supply chain to outperform competitors on customer service, time and cost [8]. There are many different rules that can help operations make these decisions and improve performance [9].

Warehouse management is designed to control warehousing activities. The complexity of warehouse operations has a large impact on warehouse performance [10]. Enterprise Resource Planning (ERP) systems are computer-based systems designed to process an organization's transactions and facilitate integrated and real-time planning, production, and customer response [11]. In particular, ERP systems will be assumed to have certain characteristics [12]. The implementation of ERP systems causes greater change with broader impacts on employees, fundamentally changing the nature of tasks, workflows, and, by extension, the jobs themselves [13]. Although the focus on outcomes, such as technology use, is important, use is not an end unto itself, but rather is best positioned as a means to attain other organizational and individual benefits [14].

2. Method
This study uses qualitative methods because it will clearly illustrate how the implementation of the Enterprise Resource Planning (ERP) System in kalijapat warehouse Pertamina Hulu Energy can be in controlling the flow of material. Techniques in interviews use guided or structured and semi-structured interviews and focus on group discussions.

The data sources in this journal are interviews with a Coordinator kalijapat warehouse who has the ability and expertise that is owned because this study purpose to determine how the optimization of the flow of material carried out by Pertamina Hulu Energy to optimize the kalijapat warehouse can be obtained. The data analysis technique used in this study is an approach developed by Miles and Huberman which includes (after data collection) data reduction, the separation of data from the unfocused and too detailed so that data can reveal patterns or themes. Next is to display data (data display) which serves to help understand the advanced analysis of certain information or events. The final process is the conclusion of the analysis based on patterns and themes. Conclusions are drawn continuously and together with data reduction and display [15].

![Figure 1. Data Processing Technique](image-url)
3. Result and Discussion

Pertamina Hulu Energy Offshore South East Sumatra (PHE OSES) is a subsidiary owned by PT. Pertamina. The company focuses on oil and gas drilling in the southeast Sumatra region and beyond. Kalijapat warehouse is one of Pertamina Hulu Energy (PHE OSES) warehouses located in Tanjung Priok, North Jakarta. PHE OSES uses an ERP (Enterprise Resource Planning) system to control activities that happens in the Kalijapat warehouse.

![Handheld ERP System](source)

This tool connects barcodes installed on each material to an ERP (Enterprise Resource Planning) system that makes it easy for foreman, supervisor & warehouseman to find material if needed & also useful for updating the stock card at ERP (Enterprise Resource Planning) System. The following below is a flowchart that is applied to Kalijapat warehouse after using an ERP system, such as Flowchart Receiving material, Flowchart Storage Material, Flowchart Internal Transfer Transfer Material, Flowchart Material Transfer Between Warehouses, Flowchart Material Expenditure, Flowchart Periodic Stock Calculation.

![Data flowchart material acceptance](source)

This source: Kalijapat Warehouse Pertamina Hulu Energy OSES.
Figure 4. Data Flowchart Material Storage
Source: kalijapat warehouse pertamina hulu energy OSES

Figure 5. Data Flowchart Material Transfer Internal Storage
Source: kalijapat warehouse pertamina hulu energy OSES
Figure 6. Data Flowchart Material Transfer Between Warehouses
Source: Kalijapat warehouse Pertamina Hulu Energy OSES

Figure 7. Data Flowchart Expenditures Material
Source: Kalijapat warehouse Pertamina Hulu Energy OSES
4. Conclusion
In this era of globalization and all information technology, Enterprise Resource Planning (ERP) System is a very appropriate solution in controlling all activities that happen in warehouses.

In the first period (July to December) in 2018, an examination and calculation of the availability of goods stock of 675 M / N were carried out. With a total difference of 2 M / N. The difference between the calculation is not more than 2% & in the second period (January to June) in 2019, an inspection and calculation of the stock of goods has been carried out as much as 630 M / N. There is a difference of 3 MN. Difference calculation, not more than 2%.

After using the ERP system in Kalijapat warehouse, inventory calculation is always optimal and if there is a maximum error of only 2% and no more than that, by looking at the graph above shows that the ERP system plays an important role in controlling the material in Kalijapat warehouse.
5. Appendix

The following is an ERP system display in which there is an example list of items stored in the Kalijapat warehouse by Pertamina Hulu Energy OSES for a certain period.

6. References

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