

# Implementation of ERP and SCM System to Improve Productivity and Competitive Advantage of Veneer Sales at PT Karya Megah Indowood

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**Abstract.** PT Karya Megah Indowood operates in the veneer manufacturing sector. The absence of technology in operational management has led to decreased productivity, prolonged workflows, and inefficiencies. Manual handling of stock management, purchasing, sales, production, distribution, and customer relations further hinders company's growth. To overcome these challenges, the company has developed and implemented ERP technology to optimize Supply Chain Management and customer relationship Management. This implementation follows a structured seven-step research design: Field Study, Business Process Analysis, Needs Analysis, System Planning, Testing, Improvement, and Implementation. The transformation is mapped through Business Process Reengineering (BPR), focusing on five key areas: Purchase Order, Inventory, Manufacturing, Sales Order, and CRM. A GAP analysis compares pre- and post-ERP processes to ensure alignment with an ideal business model. The results demonstrate that the ERP system provides a comprehensive, accessible, and efficient solution, enabling faster data processing, reduced errors, and increased productivity. By streamlining order management, the system allows for higher transaction volumes, quicker market responsiveness, improved customer targeting, and enhanced adaptability to market shifts, ultimately strengthening the company's competitive edge.

**Keywords:** Supply Chain Management; Enterprise Resource Planning; Customer Relationship Management; Business Process Reengineering; Business Mapping Analysis.

## 1. Introduction

PT Karya Megah Indowood is a manufacturing company engaged in the export sector and has products in the form of veneer which are processed and then marketed to other countries. Although this company exports frequently, it still uses a paper-based administration system that is no longer effective with current developments, paper-based methods can result in data errors when transferring information between employees and slowing down company productivity. Productivity is essential for companies in the context

of competitive business competition so every company is required to improve its performance to compete with other companies. this productivity will determine the sustainability of a company in the future. The company will be said to be good if its productivity always increases, otherwise, if the company's productivity continues to decline, a solution is needed so that productivity can return to stability [1].

Inventory is one of the most crucial assets in the operations of PT Karya Megah Indowood, inventory includes various categories ranging from raw materials such as raw wood material stocks, to finished veneer goods that are ready to be marketed. In addition, some sales will always be related to customer relations. Effective management of inventory, sales, and company relationships with customers, not only ensures the smooth running of the production process to optimize company productivity but can also control costs well so that the company can achieve a competitive sales advantage. Based on the results of interviews that have been conducted at PT Karya Megah Indowood, problems were found, namely (1) Data transfer between employees still uses the paper base method (2) Submission of offers and recording of purchases is done manually. (3) Still using a third party so that it still depends on external parties.

In this highly competitive industry, record management and good customer relations are vital in maintaining company sustainability and growth. Enterprise Resource Planning (ERP) is a system developed to manage data or information in a company in order to integrate and automate business processes in business activities/operations This study implements Enterprise Resource Planning which will help companies process data more effectively and efficiently using Odoo [2-8]. The Odoo application connects between divisions so that there is system integration that facilitates the company's internal control process [9]. The use of the odoo system is expected to help companies manage data recording to be more optimal so that company productivity can have a significant influence on increasing sales of veneer products at PT Karya Megah Indowood.

## **2. Research Method**

### *2.1 Research Approach*

This research uses a Research and Development approach. Development research is a systematic study of the design, development, and evaluation of learning programs, processes, and products that must meet the criteria of validity, practicality, and effectiveness [4] [10].

### *2.2 Research Location*

This research was conducted at the veneer processing company PT Karya Megah Indowood which is located at Jalan Kuripan, Kalitengah, Mranggen, Demak Regency, Central Java, Indonesia.

### *2.3 The data used are primary data and secondary data*

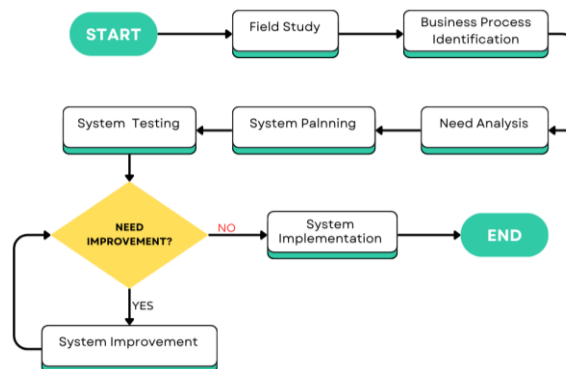
#### *- Primary Data*

In conducting this research, the author collected data through interviews and recorded data directly in the field regarding the processes that occurred. Primary data is presented during the research design phase, starting from Figure 2 to Figure 14. The data used is provided by PT Karya Megah Indowood. The purpose of this data is to ensure that the ERP system implementation is as realistic as possible, aligning with the operational tasks carried out by the company's partners, so that there are no gaps between the system trial and the actual implementation.

#### *- Secondary Data*

The data collection method is to find supporting literature data. Literature can be in the form of books, scientific journals, e-books, and so on that have something to do with the research.

## 2.4 Research Design



**Figure 1.** Research Design [4]

### 2.4.1 Field Study

This field study is carried out to obtain the data needed during the research and to find problems at PT Karya Megah Indowood.

### 2.4.2 Business Process Identification

This identification stage is to determine the business processes carried out by PT Karya Megah Indowood from preparing raw materials from suppliers to the production process, shipping, and distribution of products to customers.

### 2.4.3 Need Analysis

From the identification process carried out, we analyze the identification results to obtain findings for improvement and development of systems that can currently support existing business processes to be maximized in the future.

### 2.4.4 System Planning

The system planning process is based on the needs analysis carried out in the previous stage. The designed system will be adjusted to the odoo system used in this study to adjust the needs of the features in odoo which results in a more effective work system in the business processes at PT Karya Megah Indowood.

### 2.4.5 System Testing

At this stage, testing is carried out on the results of the Odoo system that has been created. By evaluating the system to determine whether deficiencies need to be corrected to produce a system that passes the test and meets the business needs of PT Karya Megah Indowood.

### 2.4.6 System Improvement

After system testing, system improvements are made, where improvements are made to find out whether there are parts that need to be improved or are less than optimal. Through this stage, it is hoped that there will be better system development to meet the needs of PT Karya Megah Indowood.

### 2.4.7 System Implementation

The results of the system that has gone through the improvement and development stage can begin to be applied to daily needs by PT Karya Megah Indowood, from ordering raw materials to vendors and ordering goods by customers.

## 3. Result

Based on the background of this study, problems were found, (1) Data transfer between employees still uses the paper base method (2) Submitting offers and recording purchases is done manually. (3) Still using a third party so that it still depends on external parties to the company.

The process following research design points 1–7 is presented in the business process reengineering charts (as shown in Figures 2, 6, 9, 11, and 13). The results of the research that will be discussed are the form of implementation of the Odoo system to facilitate PT Karya Megah Indowood in running its business which includes: 1) Purchase Module, 2) Inventory Module, 3) Manufacturing Module, 4) Sales Module, 5) CRM Module. This chapter describes the Process and the results of research on the implementation of the Odoo System at PT Karya Megah Indowood[4], which found in figures 2, 6, 9, and 11.

### 3.1 Purchase Module

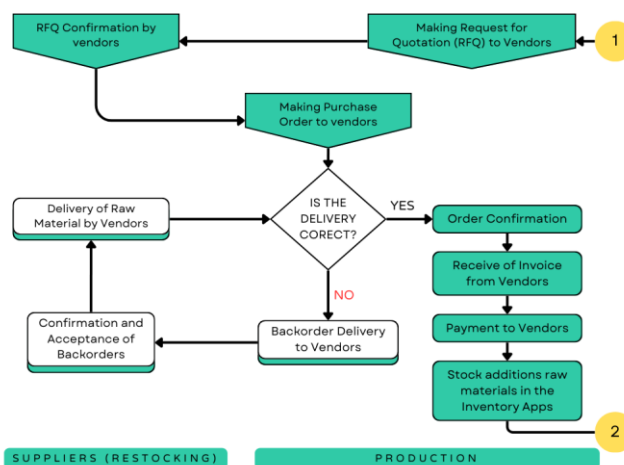


Figure 2. Business Process Reengineering 1

The first flow chart, as shown in Figure 2, illustrates the business process steps in placing an order with a vendor. The role of the purchasing function is to provide the goods and services needed by PT Karya Megah Indowood at the right time, price, and quality. The importance of this purchase becomes an essential and influential focus for every company, if the company has entered a large scale, usually purchasing becomes a very complicated process and must be properly controlled because it is related to company cash [11]. Therefore, a practical and systematic purchasing management system is needed to assist companies in carrying out their business activities using the purchasing application on Odoo [12].

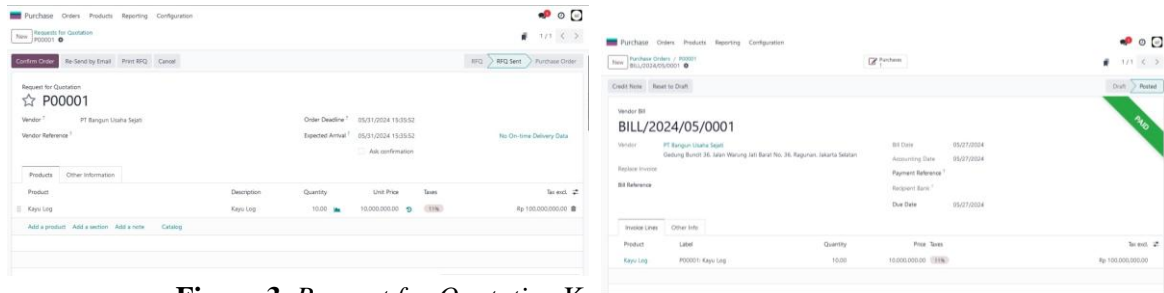


Figure 3. Request for Quotation Kayu Log at Purchase Apps

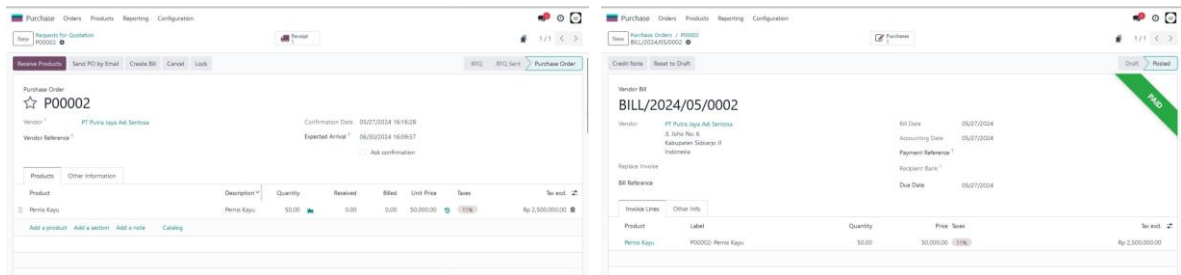


Figure 4. Request for Quotation Pernis Kayu at Purchase Apps

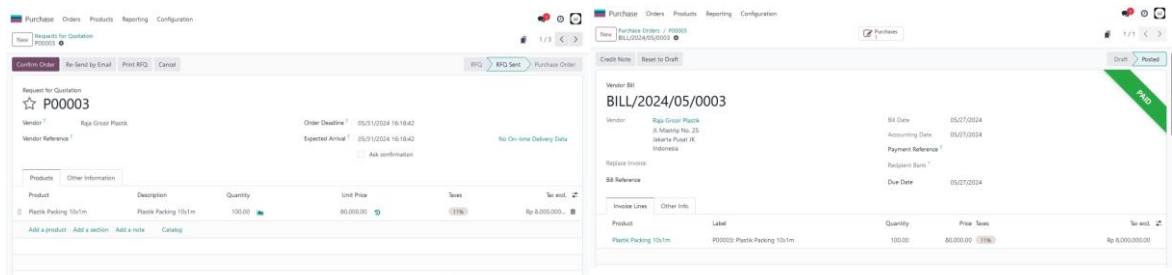
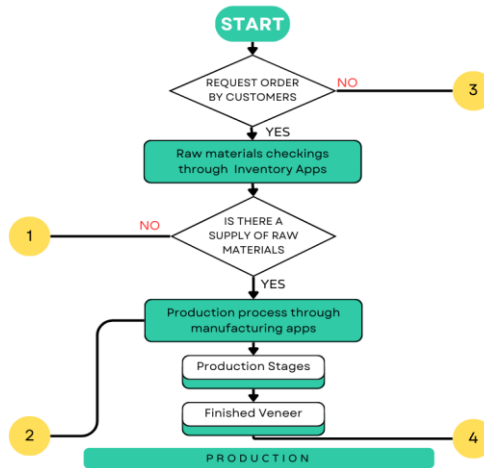


Figure 5. Request for Quotation Plastik Packing at Purchase Apps

Figure 3, 4, dan 5 as shown above, when PT Karya Megah Indowood requests price offers from the selected vendor through the purchase module. It starts with making an offer to the vendor with the aim of providing proof of ordering goods. Goods ordered from vendors will generate a purchase order report containing details of the goods ordered and the total price to be paid to the vendor.

### 3.2 Inventory and Manufacture

The flowchart in Figure 6 illustrates the business process at PT Karya Megah Indowood. Starting with an order request from a customer then checking the raw material inventory in the Inventory application section. Inventory management is very important because the amount of inventory determines or affects the smooth operation, efficiency and effectiveness of the production process and the quality of the products produced by the company [13][14].



**Figure 6.** Business Process Reengineering 2

Therefore, every company needs inventory control to get a more optimal inventory level. The management carried out is to always keep stock levels low to minimize inventory management costs, and match new orders only when stock runs out [15].

Product Name	Internal Reference	Product Template Tags	Sales Price	Cost	On Hand	Forecasted
Kayu Log			Rp 10.000.000,00	Rp 10.000.000,00	10,00	10,00
Pemis Kayu			Rp 50.000,00	Rp 50.000,00	50,00	50,00
Plastik Packing 10x1m			Rp 80.000,00	Rp 80.000,00	100,00	100,00

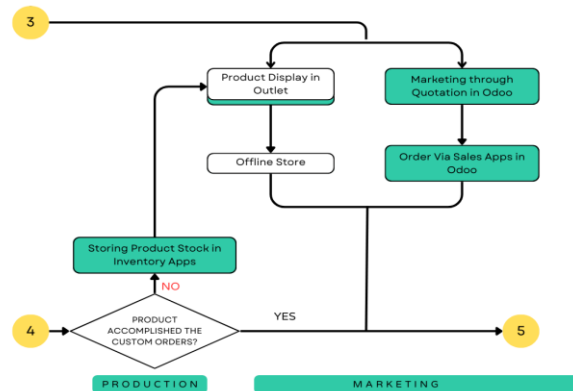
**Figure 7.** Inventory Stock checking at Inventory App

Through the inventory application, as shown in Figure 7, the products and their quantity can be monitored according to the on hand in the inventory module.

Product	To Consume	Quantity Consumed
Kayu Log	1,00	1,00
Pemis Kayu	5,00	5,00
Plastik Packing 10x1m	20,00	20,00

**Figure 8.** Manufacturing Orders at Manufacturing App

Figure 8 shows the production process recorded through the manufacturing application on the Odoo system by entering the product name, production capacity, and the previously created bill of materials input.



**Figure 9.** Business Process Reengineering 3

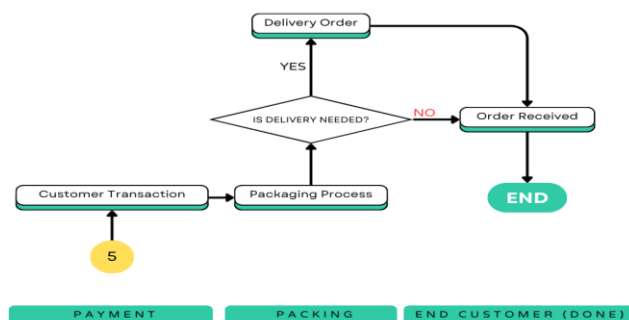
Figure 9 shows that products that have been manufactured and do not meet customer orders will be stored and recorded in the inventory application section. Products that are not made to fulfill custom orders will be forwarded to the marketing department. Where product marketing is carried out by displaying the veneer product catalog in the offline store and offering in the sales application in the odoo system. If the customer agrees with the offer on the odoo system, the customer can continue to place an order through the sales application so that a sales order is obtained.

Date	Reference	Product	From	To	Quantity	Status
05/27/2024 16:45:23	WH/MO/00001	Veneer	Virtual Locations/Production	WH/Stock	20,000.00	Done
05/27/2024 16:45:23	WH/MO/00001	Plastik Packing 10x1m	WH/Stock	Virtual Locations/Production	20.00	Done
05/27/2024 16:45:23	WH/MO/00001	Pernis Kayu	WH/Stock	Virtual Locations/Production	5.00	Done
05/27/2024 16:45:23	WH/MO/00001	Kayu Log	WH/Stock	Virtual Locations/Production	1.00	Done
05/27/2024 16:27:04	WH/INV/00003	Plastik Packing 10x1m	Partners/Vendors	WH/Stock	100.00	Done
05/27/2024 16:17:46	WH/INV/00002	Pernis Kayu	Partners/Vendors	WH/Stock	50.00	Done
05/27/2024 16:08:45	WH/INV/00001	Kayu Log	Partners/Vendors	WH/Stock	10.00	Done

**Figure 10.** The product automatically increases in the Inventory App

Figure 10 shows that in the above inventory system there is an increase in product inventory which automatically reduces raw material inventory due to production activities.

### 3.3 Sales Module



**Figure 11.** Business Process Reengineering 4

The process in the flowchart shown in Figure 11 involves the payment of products ordered by customers and the product packaging process by PT Karya Megah Indowood. After both processes are complete, the product will be sent via land, sea, or air shipping or received directly by the customer if the customer buys directly at the PT. Karya Megah Indowood outlet.

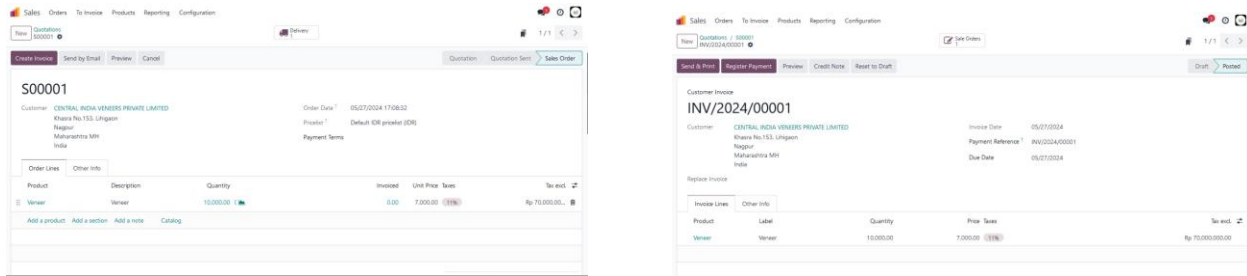


Figure 12. Sales Order

Figure 12 explains the purchase order made by the customer through the sales module in the Odoo system. The Sales module is the main module in Odoo that functions to handle sales transactions, starting from creating offers, viewing orders that are ready to be processed, to viewing orders that have been sent.

### 3.4 CRM Module

Based on the needs analysis and adjustments to the company's existing business processes, the Business Process Reengineering (BPR) for the CRM Module consists of five key stages: creating potential lead data, New Stage, Target Data Verification (Qualified Stage), Proposition Stage, and a final decision on whether the customer completes a purchase (Won) or not (Lost). All stages are systematically recorded in the Customer Relationship Management (CRM) apps of the ERP system.

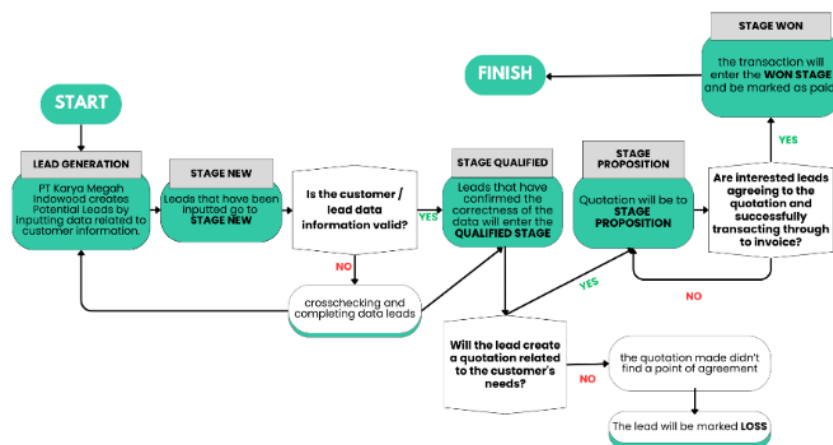


Fig 13. Business Process Reengineering 5 – CRM Apps



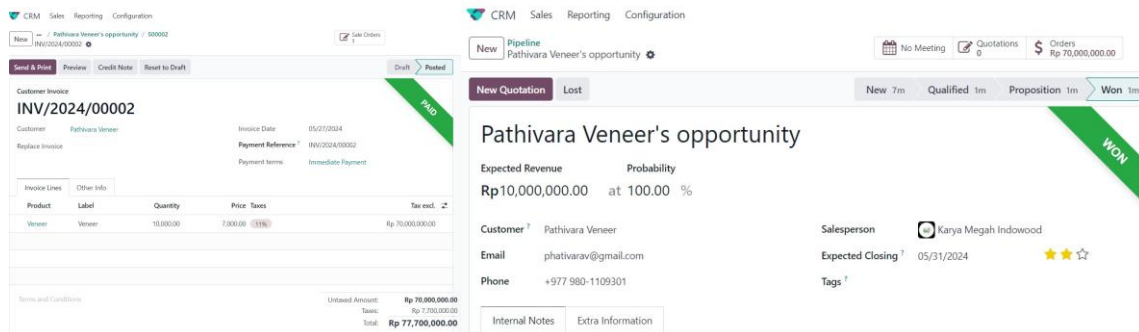


Fig 14. CRM (Customer Relationship Management)

The use of CRM applications in the odoo system will help companies start from relationships with prospective customers to regular customers [7] [16]. There are several stages for classifying customers used at PT Karya Megah Indowood Indowood (1) New is the initial stage in the CRM process, where new prospective customers have been identified and added to the company's odoo system. this data may come from various sources, such as websites, email marketing, or networking (2) Qualified means that the targeted Prospective Customers have met certain criteria that indicate that they are promising prospects, and are ready to step into the bidding process (3) Proposition means that a proposal has been submitted to the Target Customer. The proposal explains in detail how the product or service can help the lead achieve their goals.(4) Won means that the proposed offer has been successfully approved by the target customer so that this target customer will turn into a buyer. This is the final stage in the CRM process, and is the result of the company's efforts in growing and maintaining relationships with its customers.

### 3.5 GAP Analysis

In ERP implementation research, the Gap Analysis Table serves to identify and analyze the differences (gaps) between the current system or business processes (as-is) and the expected system or business processes after ERP implementation (to-be). The main functions of the GAP Analysis table include analyzing differences, identifying needs, supporting implementation planning, reducing implementation risks, and ensuring that the ERP meets business requirements. Table 1 presents a comparison between the previous business process (conventional system) and the business process after implementing the ERP system. The comparison is explained by analyzing the needs, current conditions, and conditions after ERP implementation. The results indicate an increase in productivity, which enhances the company's competitiveness.

#### 3.5.1. Data recording

Previously, vendor data was recorded using Microsoft Word and notebooks, which made the process lengthy and inefficient. To improve this, the ERP system provides a more comprehensive and accessible solution, enabling faster, more effective, and efficient data recording while reducing operational errors. This improvement directly impacts productivity by increasing the number of transactions that can be processed simultaneously through an integrated and efficient order system (Figure 3,4,5, and 12). The ERP system also enhances the company's competitive advantage by allowing quicker responses to market demands, enabling customer targeting, creating offers and requests, and adapting swiftly to market changes.

### 3.5.2. Purchase order

In the past, purchase orders to vendors were made without being recorded in a system, as illustrated in Figures 2–5. With the ERP system in place, all sales transactions are now automatically recorded. The system performs real-time stock checks on finished goods, ensuring accurate inventory management. Purchasing from vendors becomes more streamlined through the automated purchasing and inventory application, which also updates raw material stock automatically after purchase. Additionally, all raw material purchase transactions are recorded and stored systematically within the system.

### 3.5.3. Manufacturing order

Efficiency in the manufacturing process is crucial. Previously, employees had to manually check warehouse stock and order raw materials. With the ERP system, particularly the manufacturing application, the production process is significantly improved. Raw material usage is automatically recorded, ensuring a seamless and efficient workflow.

### 3.5.4. Sales order

The company requires an efficient system for recording sales data and checking stock inventory. Before ERP implementation, the process was time-consuming, involving manual stock verification with warehouse staff and recording stock movements in Microsoft Excel. With the ERP system in place, stock availability can now be checked automatically through the Sales application (as shown in Figures 11 and 12). This automation speeds up business processes and ensures more accurate stock tracking in real time whenever a transaction occurs.

### 3.5.5. Customer Relationship Management (CRM)

Before implementing the Odoo system, the company relied on manual processes, leading to difficulties, delays, and inefficiencies. After adopting the Odoo system (Figures 13 and 14), productivity improved significantly. Enhancements include better customer data recording, faster response times, reduced errors, and overall increased efficiency. Furthermore, with a more effective CRM module, the company can now respond to customer inquiries more swiftly, gaining a competitive edge over competitors still using conventional systems.

Gap analysis is designed to measure the difference between the actual situation and the desired or expected situation, as well as to determine the level of achievement of the desired results and to help design actions and strategies aimed at achieving these goals [17][18]. Gap analysis is based on two conditions, namely the fulfilled state and the potential state. By conducting a gap analysis, the company is expected to be able to maximize existing performance to the potential and resources that should be fulfilled. Gap Analysis defines a comparison of existing business architecture with the target business architecture, to find gaps between the two [17] [19].

**Table 1.** Gap Analysis

No	Business Process	Needs	Fulfillment			AS IS (Existing Business Process)	Information ERP Odoo System (Business Process Reengineering)
			N	P	F		
1.	Vendors Record	Has raw material vendor data, which includes product information, prices, and specifications.			√	Manual recording using Ms. Word and physical notebooks	Record vendor data through the odoo system in the purchase module, to make it easier to check product information.
2.	Purchase	Automaticall y purchase raw materials from vendors			√	Employees must always check stock in the warehouse and order raw materials manually	Purchasing from vendors is easier because it is automated through the purchasing and inventory application.  Through the purchasing application, all data on raw material purchase transactions to vendors will be recorded and stored automatically by the system.
3.	Manufactur e	Makes it easier to start the production process			√	Employees must always check stock in the warehouse and order raw materials manually	Through the manufacturing application, the production process will be easier because the recording of raw material stocks used for the production of finished materials will automatically be recorded in the system.
4.	Sales	Automatic stock checking of finished goods that have been sold or not			√	Stock items are checked manually using Ms. Excel	Check stock availability of sold items through Inventory Application and Sales Application
	Sales	Making quotations for cutomers who need finished goods			√	Offer directly to customers with word to mounth	Provide offers to customers using RFQ in the Sales application, if the customer agrees, he will place an order using the sales application.

No	Business Process	Needs	Fulfillment			AS IS (Existing Business Process)	Information ERP Odoo System (Business Process Reengineering)
			N	P	F		
5.	CRM	Record of potential customers and lost customers			√	There is no record of the company's potential customers	Through the CRM Application, it makes it easier for the Company to find and categorize customers who have the potential to become regular customers.

#### 4. Discussion

The Odoo system is essential for companies seeking to enhance operational efficiency. One key component is the Customer Relationship Management (CRM), which not only connects businesses with customers but also helps sales teams assess the potential of target customers. A study conducted by Hawari et al. (2023) on the implementation of CRM using Odoo in a quail farming case study in Pematang found that the Odoo application provides significant benefits [20]. It strengthens customer interactions, increases satisfaction and loyalty, and simplifies business process tracking. Therefore, it can be concluded that implementing the CRM module within an ERP system is crucial for businesses aiming to improve operational quality and maintain strong customer relationships. In the case of PT Karya Megah Indowood, the CRM process was implemented through key stages, including customer prospecting (lead generation), the Qualified stage, the Proposition stage, and the Won or Lost stage.

Implementation of Odoo-Based ERP in The Case Study of Micro, Small and Medium Enterprises (MSME) "Woody Moody Jakarta" [21]. This study also implemented several odoo modules, including inventory, Accounting, Sales, Purchase, Website, Contact, and Manufacturing. Judging from the research, the application of the same modules as those implemented at PT Karya Megah Indowood, it can be concluded that odoo is also very helpful in meeting business needs in this modern era, but according to the research, the implementation of Odoo ERP in the company follows several stages, including business needs analysis, observation, analysis and design, configuration settings, testing, computing implementation, application demo, and measuring the level of user acceptance of the Odoo ERP application. This can also be applied to PT Karya Megah Indowood at the beginning of using the odoo application.

#### 5. Conclusion

This study examines the effectiveness of Odoo ERP system implementation at PT Karya Megah Indowood, focusing on the purchase, sales, inventory, manufacturing, and CRM modules. The results showed that the use of Odoo significantly improved operational efficiency in various departments. The purchase module enables more structured and efficient purchase management, while the sales module optimizes the sales process, increases conversions, and speeds up transaction closure.. The inventory module provides more accurate control of stock items, reduces overstocks and understocks, and optimizes storage costs. On the other hand, the manufacturing module improves productivity through better production planning and control, reduced downtime, and improved output quality. The CRM module helps improve customer relationships through better contact management, interaction tracking, and customer data analysis, leading to increased customer loyalty and satisfaction. In addition, data integration between modules within Odoo provides a holistic view of the company's operations, enabling more informed and data-driven decision-making, and reducing data redundancies and inconsistencies. Based on these findings, it is recommended that PT Karya Megah Indowood continue to optimize the use of Odoo, conduct regular training for

employees, and conduct periodic evaluations to ensure the system is running optimally and effectively, to support the company's future growth and development.

## 6. Acknowledgment

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