

# Implementation of Application and Product System (SAP) in Metal Coating Process Manufacturing Company

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## Abstract

In the development of the Industrial Revolution 4.0 era, the use of an Enterprise Resource Planning System is a long-term investment for a company to improve efficiency, performance, and decision-making tools for the company. In general, it uses a centralized database for various business processes to reduce manual labor and simplify existing business workflows. ERP systems usually contain Dashboards where users can view real-time data collected from across the business to measure productivity and profitability. This means that any data or information received will be updated immediately as soon as the user inputs the data into the time system even though the data has been closed, the company can know and control the condition of the company every day and can control a production process so that decision making can be done quickly, carefully, and precisely because it is based on valid internal data and is always up to date. there is still a difference in data between the transaction process. The purpose of the research is to process information in real-time and accurately. The research stage begins with a literature study, hardware prototypes, and making programs. The results of the research are an increase in transaction accuracy of 43% after SAP implementation is optimally implemented.

**Keywords** : ERP, MRP, SAP & Realtime Operational

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## I. INTRODUCTION

### A. Background.

The current production process is still carried out manually, the planning of the production process is still using the Master Requirement Planning (MRP) system which is not maximally integrated with the existing Enterprise Resource Planning (ERP) system, there is still a gap or difference in data between the actual data and the data in the System Application and Product (SAP), this can reduce the effectiveness of using SAP in a company so that the calculation of raw material purchases using the MRP method does not run optimally, it is explained that delays in inventory management can result in decreased performance in the company [1], apart from that the impact of the difference in data can harm the company because uncontrolled data has a broad impact on company operations. The process flow description can be seen in Fig. 1 as follows:

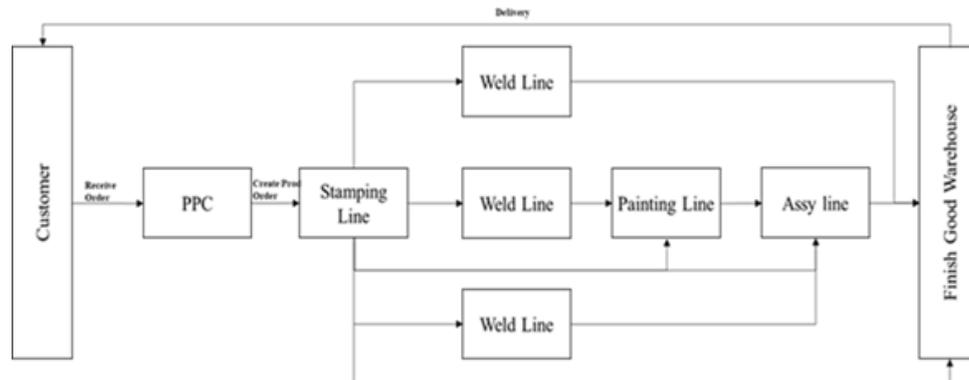
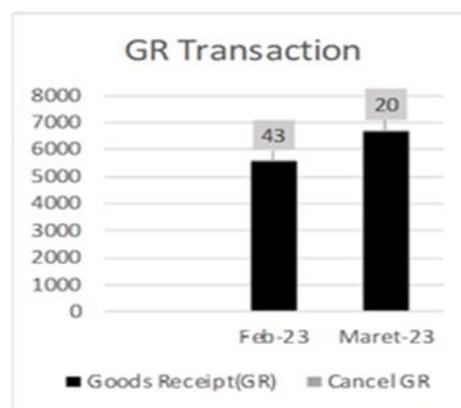


Fig. 1. General Production Process Flow

Information on the arrival of requests for goods from customers is carried out based on requests that come from customer service through sales and marketing, the information is conveyed to the PPC section to prepare and plan raw materials, capacity, and production schedules, until the delivery of products ordered, there are still obstacles faced such as planning raw materials, determining production schedules and calculating machine capacity and processes. In the business process above, the PPC (Production Plan & Control) section receives monthly orders from customers, then calculates the orders sent by customers against the capacity of each line and is processed into monthly loading vs capacity. From monthly loading vs capacity, we can find out whether or not the orders received can be fulfilled from the current capacity. Furthermore, PPC makes a daily production schedule for each production line based on daily orders sent by customers. After receiving production planning from PPC, the production department carries out production according to the planning made by PPC, the finished goods are then sent to the Finish Good warehouse for further delivery to the customer.

*B. Identification of Problems*

Data input that is not real-time is one of the factors causing the difference between actual data and data in the system. In addition, there are still many other modules of the SAP system that cannot be utilized optimally. Therefore, an evaluation is needed so that it can be known the factors that cause the non-optimal performance of SAP implementation so that the data cannot represent the actual process. In addition, it is necessary to redesign new business processes from the implementation of the SAP system to reduce problems that arise due to the non-optimal use of SAP. The graph below shows that there are still errors in processing Goods Receipt (GR) transactions in February there were 43 errors in inputting the GR process from 5,540 transactions that occurred in February 2023, this is the cause of inaccurate data accuracy. See Fig. 2.



Description	Feb-23	Maret-23
Goods Receipt (GR)	5540	6686
Cancel GR	43	20

Fig. 2. Goods Receipt Transaction Before Implementation SAP

### C. Objective

The use of an ERP system in a company is very important in integrating the company's operational data that has been processed and can be used as a tool to decide in a company. SAP is very important for companies to integrate various modules so that they can become a unified thing. One of the aspects causing failure that is quite a challenge in ERP implementation is the social and organizational aspects. Employee motivation in accepting and running the ERP system in the ERP implementation project is one of the biggest failure factors that affect ERP implementation [2]. However, more than that, the use of SAP has many advantages, so it is very important to use it. In its use, SAP can provide real-time processing where all processes can be done directly anywhere. Because SAP is integrated, if there is a change in one module, the other modules will also change automatically. With that automatic change, so that the process can be seen immediately at that time without having to wait some more time to see the results. The research aims to process information in real time and accurately. This research builds a SAP System. The purpose of this research is to help speed up the flow of information regarding the condition and status of production processes in real-time. The objectives expected from the results of this Final Project research are as follows:

1. Knowing the factors that cause the non-optimal performance of SAP implementation that has been running so far.
2. Provide suggestions for improvements to problems that cause transactions to not run optimally.

### D. Literature Review

ERP system or Enterprise system is a software that has various modules that are integrated to provide support to functional parts of a company such as finance, human resources, marketing, sales, and inventory management [3]. The complexity of ERP systems is an issue that is always emphasized during application development. ERP implementation projects in a company are considered very risky because they are large, complex, usually unknown to the organization, and implemented under tight schedules [4]. It is explained that delays in inventory management can result in decreased performance in the company [1]. SAP implementation is an application of information technology that integrates the operational activities of a company [5]

The main objectives of the purchasing department are to maintain the quality and value of the company's products, minimize the turnover of capital used to supply stock, maintain the flow of goods in and out, and strengthen the competitiveness of the organization or company. Purchasing can be interpreted as an effort to fulfill the needs of goods or services needed by the company and can be received on time with appropriate quality and at a favorable price [6]. Inventory is recoverable goods that will be used to fulfill a specific purpose, e.g. for use in a process. that will be used to fulfill a specific purpose, for example for use in the production or assembly process, for sales returns, or spare parts. production or assembly process, for sales returns, or spare parts. a piece of equipment or machinery [7].

SAP is a business solution software that consists of enterprise resource planning and interrelated software solutions. solution software consisting of enterprise resource planning and interrelated software solutions such as supply chain management, customer relationship management, product lifecycle management, and product life cycle management. such as supply chain management, customer relationship management, product lifecycle management, and supplier relationship management, supplier relationship management [8]. SAP implementation is an information technology application that integrates the operational activities of a company [9]. SAP is known because it is one of the ERPs that provides best practices from well-known companies in the world, so it guides companies that implement it how best practices should be so that it guides companies that implement it how best practices should be carried out so that the company's performance increases along with the implementation of SAP ERP [10].

## II. RESEARCH METHOD

The research phase begins with a literature study, looking for references, designing the system and determining the components to be used, making hardware prototypes, creating programs, and conducting tests. The flowchart of the research stages is shown in the Fig., the details of the research flow can be seen in Fig. 3. as follows:

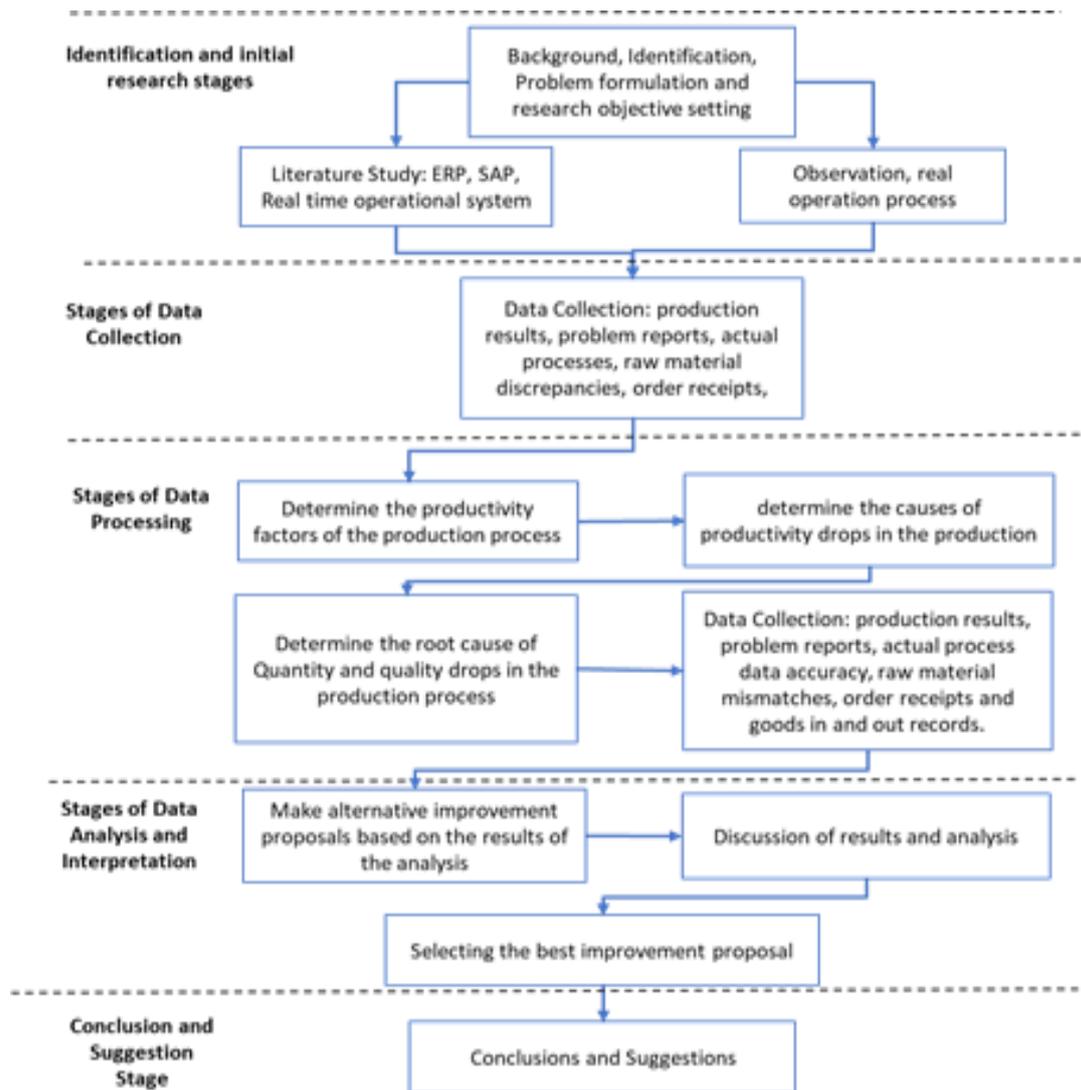


Fig. 3. Framework of Research

Explanation of the Research Framework Diagram:

1. Literature Study by searching and reading some literature, and journals about ERP, and SAP in the Production process
2. Observation/observation in the production machine area
3. Collection of data needed to determine what factors affect the decline in productivity and quality.
4. Make alternative suggestions for improvements based on the results of the analysis,
5. Discussion of Results and Analysis
6. Choose the Best Proposed Improvements

The Best Improvement All stages are carried out based on the data and results of the SAP design trials that will be made and developed, each activity is carried out according to a predetermined schedule.

## II. RESULTS AND DISCUSSION

### A. SAP Operational Process Flow

The SAP Operational Process Flow must describe the actual process in the company, starting from the receipt of goods from the supplier until the goods are sent to the customer. All process flows must be recorded, or transactions made, so that the entry and exit of goods can be tracked and data can be used by the company to make a decision, The following Fig. 4 explains the flow of the SAP System implementation:

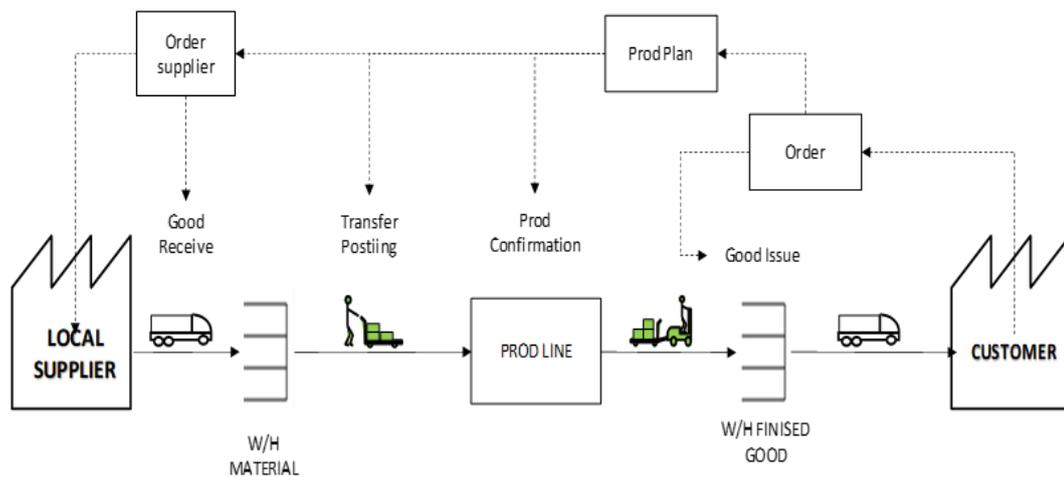


Fig. 4. MIFC Flow SAP

It can be seen from the picture above how the flow of goods and information are related to each other, meaning that SAP is used by companies to describe the flow of goods processes from arriving from suppliers to goods sent to customers. The following is an SAP process related to the manufacturing operations of the Company:

#### B. Create Prd.Ord

The creation of Prd.Orders are carried out by the PPC team and then shared with the relevant parts of Production, Inventory & and Procurement for the next Prd. Ord to be used as a trigger for the next process.

#### C. Good Receipt (GR) Transaction Process

This transaction process is carried out after the receiving team receives the goods sent from the supplier, after the goods received are by the documents brought by the supplier, the document is processed GR (Good Receive). This transaction process aims to bring up stock in the warehouse and provide information regarding the arrival of these materials.

#### D. Posting Transfer Transaction Process

After receiving production planning information from the PPC team, the W/H team prepares materials according to the production plan, and then the prepared materials are pushed to the production line for processing. The movement of materials from the warehouse to the production line is carried out by Transfer Posting transaction in SAP.

#### E. Production Confirmation

This production confirmation process is carried out after production has carried out the process by the production plan made by the PPC team, then the Prd. Orders made by PPC are confirmed by the actual production achievement, this transaction is carried out to reduce the stock of materials sent by the W / H team to production which then forms stock by the products that have been produced.

#### F. Delivery Process to Customer Good Issue (GI)

The logistics team prepares the goods according to the customer's request, then the prepared goods are loaded onto the truck. After completing the loading process to the truck, the preparation team informs the administration department to make a road letter document for the driver to carry as a shipping document. The transaction process is the Good Issue transaction process, which is carried out to reduce the stock of goods in the Finished Goods warehouse. This document is usually used by the Finance department to bill the customer.

G. Analysis of Research Results

The final step in this research is to analyze the results of the research that has been done, as well as provide suggestions for the SAP transaction process that occurs in the Metal Process Company. The results of observations made from the Good Receipt (GR) process to the Good Issue (GI) process found several problems that have a direct impact on data accuracy in SAP. An explanation of the process can be seen in the following Fig. 5

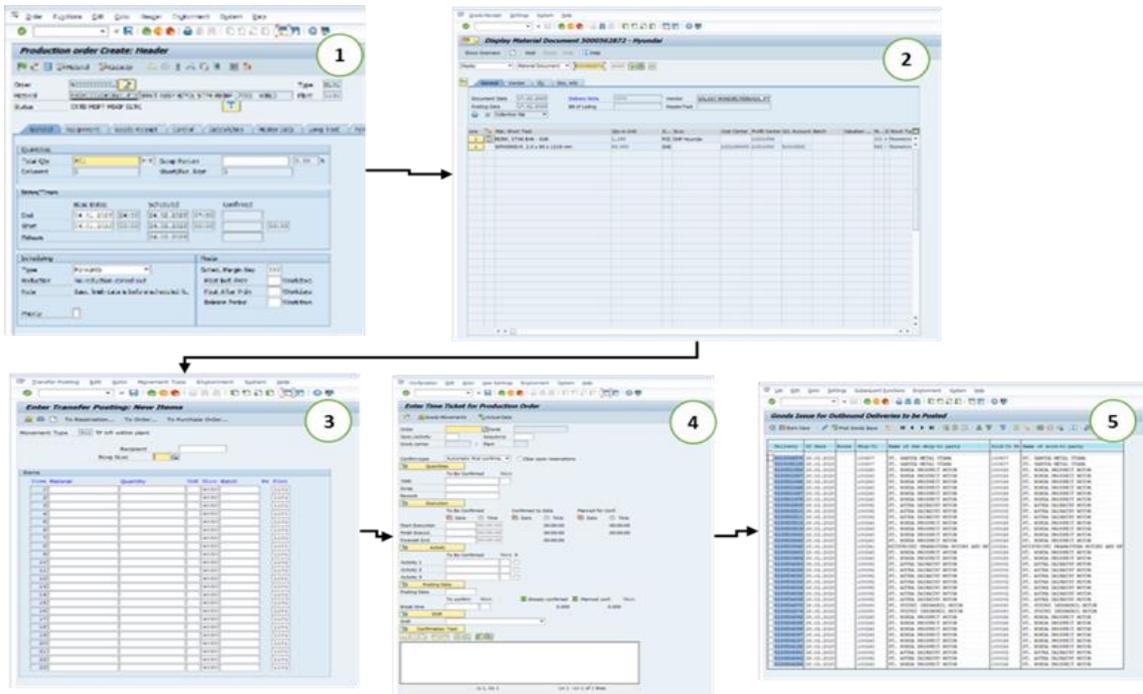
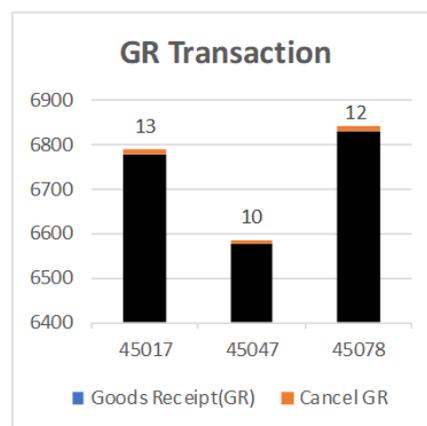


Fig. 5. SAP System Implementation in the Production Process

After the implementation of SAP the transaction process can be more accurate, previously canceled GR was 31.5 cases after the implementation became 11.7 cases, so there was a 43% improvement after SAP implementation, the detailed explanation can be seen in Fig. 6 as below



Description	Apr-23	May-23	Jun-23
Goods Receipt (GR)	6778	6577	6832
Cancel GR	13	10	12

Fig. 6. Goods Receipt Transaction After Implementation SAP

### III. CONCLUSION

System Application and Processing (SAP) is one application that is often considered an accounting application but is a more complex application that is used by company owners to carry out a business integration which of course will be very complicated if done manually, so that the implementation will be not optimal because the data becomes inaccurate. In addition, processes that are related to one another require companies that use SAP as the basis for the system used to make comprehensive improvements, so that they can optimize the use of this system.

### IV. ACKNOWLEDGMENT

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