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Developing Standard Operating Procedure for Production in North Sumatra Construction Companies

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A B S T R A C T

In the industrial era 4.0, the competition between corporate companies is getting tighter. This is a reference for the company's productivity in operating a product or service, one of which is PT.X. It can be seen from the running performance process, PT. X has constraints on the production performance process. Therefore, PT.X seeks to increase productivity in the production process. So that in this study, a proposal design was carried out on a standard operating procedure (SOP) using the Business Process Model (BPM) method. The result of the proposed design with BPM is to minimize the production time by 2 hours 40 minutes so that the production process can run more effectively and efficiently. With that, the best solution in handling this case research provides suggestions on the work process that is running with efficient improvements.

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1. Introduction

In the era of industry 4.0, currently, technological and digital developments are increasing. This can be seen from the ever increasing digital developments such as mobile phones which continue to provide the latest innovations (Junaedi, D., Mas'ud, M. I. 2018, Ismail, N., Komari, A., Rahayuningsih, S. 2018). Not only that, competition in the industrial world is increasing so that companies must be able to compete to survive or even improve their company performance. One of the success factors in the company is company productivity (Hanik, U., & Mas'ud, M. I. 2019). Fauzi, A., Mas'ud, M. I. (2019), Chandurkar, P., Kakde, M., Bhadane, A. (2015) The productivity of this company can be increased by improving its work processes, especially in this company which is specialized in the production process which greatly affects its performance so that this becomes a good improvement for the company so that running activities become more effective and efficient through analysis of the application of standard operating procedures (SOP) (Irawati, R. 2016, Gishella, S. 2018, Hermansyah, M., Bashori, H. 2017, Mager, S.R., dkk. 2007, Manurung, W.R. (2019). PT. X is a national private company that produces piles. PT. X is experiencing problems in the production process that is less than optimal .

By looking at the lack of suitability in the production process of PT. X. Therefore, in this research it is necessary to arrange the production process to support efficiency and effectiveness by compiling SOP.

2. Literature Review

Winata, S.V. (2016)., Wijaya, W. (2016) Standard Operating Procedure (SOP) is a document regarding operational activities carried out by a company so that its work is correct, precise and consistent so as to produce predetermined products (Asih, H.M., Fitriani, S. 2020., Setiawan, A., Eliezer, K. Prasetyo, K.T., (2019). SOP is a reference regarding steps or stages related to applicable activities which are work activities within the company (Sayendra, B., Priyandari, Y., Zakaria, R. 2015). Standard Operating Procedure (SOP) aims to explain fixed standards regarding repetitive work activities carried out in an organization (Anam, K. 2016, Tanujaya, C. 2017).

SOP has been researched (Achmad, F.I., Rispianda., Liansari, G.P. 2016)) for the process of selling production and purchasing at CV. Cahaya Abadi Teknik, namely the design of a proposed business process in the form of standard implementation procedures or rules that are supported by forms, work instructions and designing a special prototype for the order handling business process.

Ningtiyas, R.K., Pulansari, F., Hayati, K.R. (2018) Business Process Management (BPM) is a business process of executing and managing sales plans by changing manual processes to digital. In the standard procedure for controlling the implementation of sales or in the procedure for managing the implementation of sales, it results in time efficiency and operational cost efficiency.

3. Methodology

In this study, the case study method was used in which case studies were extracting in-depth information through the problems that existed around them. This information is about the problem data which is used as a support in finding a solution.

Method of collecting data

The data used in this study came from primary and secondary data, Primary data collected in the study, namely through field surveys and direct interviews with employees to obtain information on employee performance data such as company organizational structure data, company SOPs, production process data and company profit / profit data per year. Secondary data obtained from the company, namely data for SOP design.

Data Processing Methods

Processing data in the production process using SOP analysis with a business process model. Through the interview stage about the production process at the company then draw a production flow using Microsoft Visio 2007 and analyze the process, and the final stage is the design of the SOP proposal using the business process model method.

4. Results and Discussion

As time goes by, the company is growing, this can be seen from the development of the types of products that are produced at PT. X. In this study, business process modeling focuses on the production section.

Production Process Analysis at PT. X

The discussion of the results of the research and testing obtained is carried out in the form of a description of the diagram. It can be seen how the work process in the company is carried out so easily to see the causes of the inefficient and effective work process taking place.

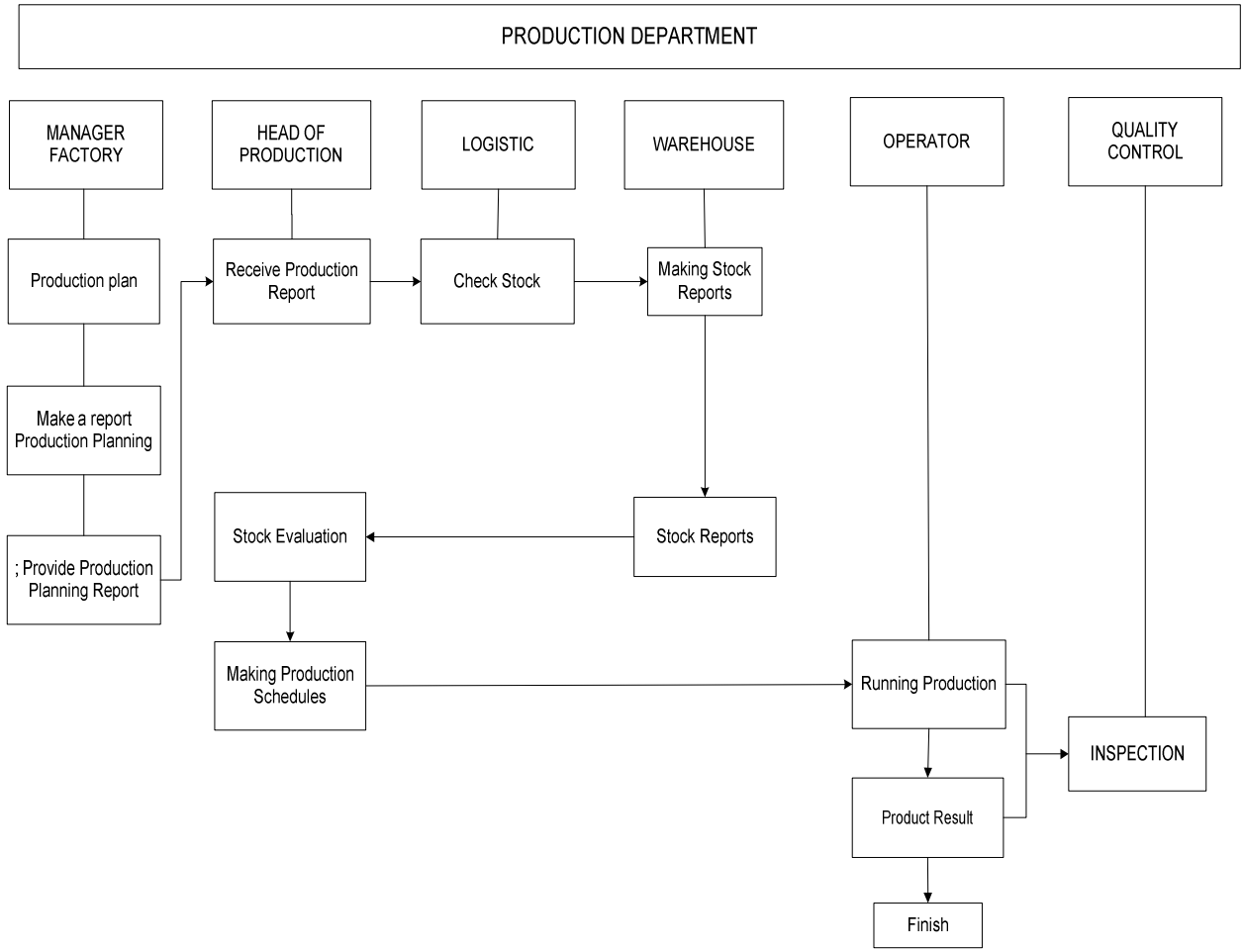

Figure 1. Image of the current Production Process

Table 1. Description of the current Production Process

Process group	Activities	Activity time
Production	Production plan	1 hour (60 minutes)
	Make a production planning report	2 hours (120 minutes)
	Provide the results of production planning reports	1 hour (60 minutes)
	Receive the results of the production plan report and arrange for follow-up	4 hours (240 minutes)
	Check stock	2 hours (120 minutes)
	Create stock reports	30 minutes
	Stock report	30 minutes
	Stock evaluation	25 minutes
	Create a production schedule	10 minutes
	Running production	8 hours (480 minutes)
	Product yield (waiting to dry)	7 hours (420 minutes)
	Inspection during production	8 hours (480 minutes)
	Product inspection results	3 hours (180 minutes)
	Total	**37 Hours 35 Minutes**

Production Redesign of PT. X

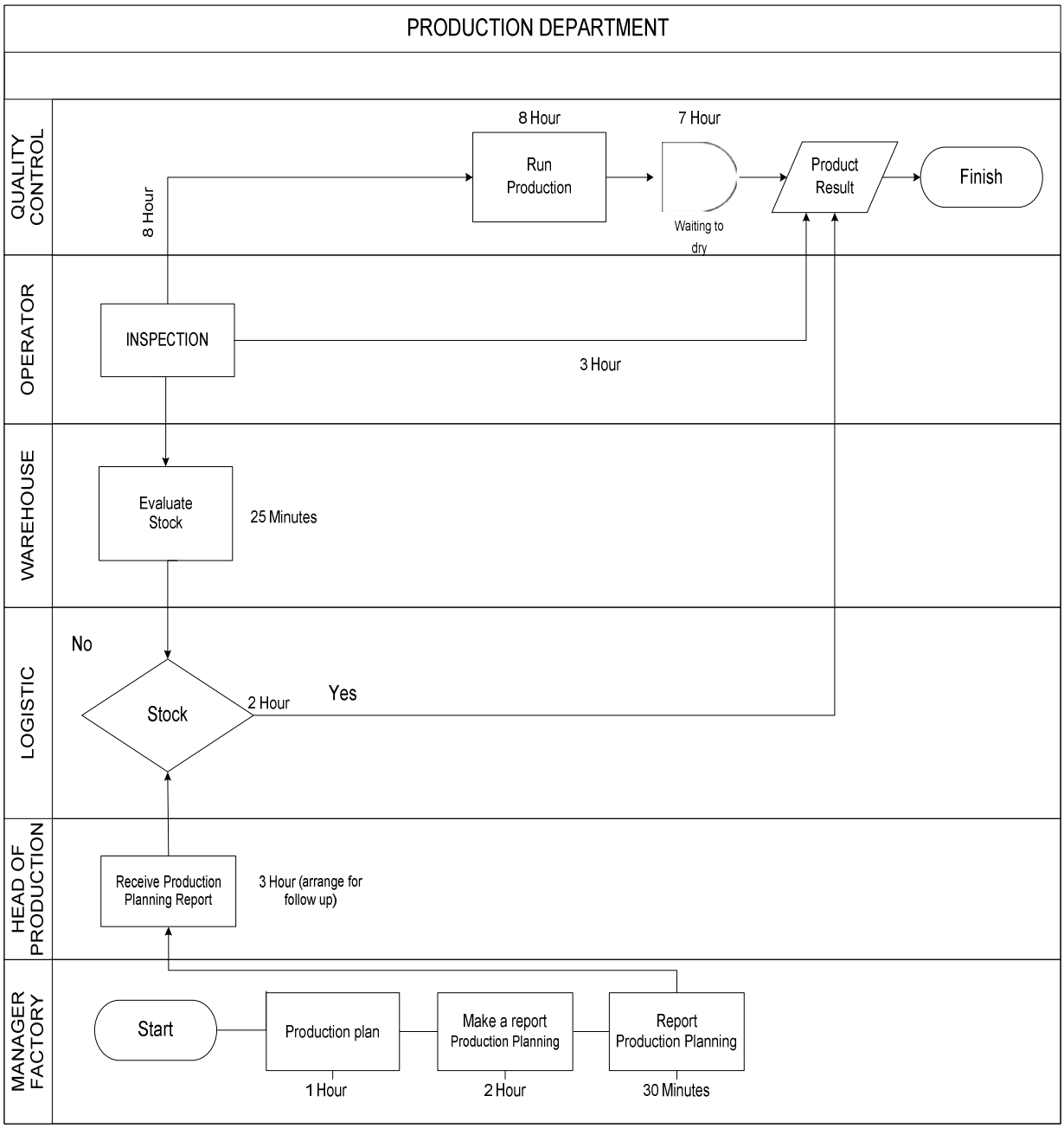

Figure 2. Image of Proposed Improvement of Production Process

In the diagram of the improvement intestine describes the optimal production process flow for the production of 42 piles starting from production planning to output. This process starts from the factory manager who prepares for a production plan for 1 hour, then makes a production planning report for 2 hours and analyzes the results of the report again and gives it to the head of production (30 minutes). The head of production receives a production planning report and arranges it for preparation of available stock in the warehouse (3 hours). After that, the logistics department checks the stock on the ready stock products and submits the stock check list for the materials produced if the product is not ready stock (2 hours).If the stock of piles still exists or meets the demand, production is not carried out, but on the other hand, if it is insufficient or does not meet the demand, then production of piles is carried out. Continue to the warehouse to make a report on the stock of materials that are prepared for production and to evaluate the stock. Then the quality control conducts material checks, helps prepare

materials for production, checks production activities until production results (11 hours). And finally, operators carry out production orders, make preparations for production, run production, supervise during production (8 hours) and monitor production results (3 hours) to completion. However, these products cannot be used immediately because they have to wait to dry for 7 hours according to national standards, so the total time needed is 34 hours 55 minutes.Based on the analysis of the time required at PT. X for the production of 42 piles, the result is 37 hours 35 minutes. Meanwhile, the results of the design of the proposed improvement of the production process at PT. X is obtained time 34 hours 55 minutes. From this it is obtained a reduction of time for 2 hours 40 minutes, so that the results of the proposed design have an influence on the company's production. By being more effective and efficient than the time required before the design is carried out.

Business Process Activities

Activities in business processes are classified into the BVA (Business Value Added), RVA (Real Value Added), BVA (Business Value Added) or NVA (Non Value Added) category. Real Value Added (RVA) is an activity that can be felt directly by external customers and is needed to produce output for customers. Business Value Added (BVA) is an activity that cannot be felt directly by external customers and does not provide added value to process output directly but. This activity is used as a supporting activity for non-value added companies (NVA). It is an activity that does not provide added value to the company or customers because NVA can create waste which results in losses for the company. But in this case, research can cut the value added that does not provide important value to ongoing work activities.

Table 2. Business Process Activities

Process Group	Process Name	Process Owner
Production	Warehouse	Head of Production and Project Manager
	Logistic	Head of Production and Project Manager
	Production	Head of production
	QC	Head of production

Table 3. Analysis and business process improvement

No.	Activities of	Performers of	Classification	Process Analysis of	Proposed Improvement
1	Production	Project Manager	BVA	This activity is an activity carried out by the company. This activity includes business value added because this activity is a support for running business processes by minimizing time efficiency and has no direct impact on products for customers. However, the obstacle is that there is no form to evaluate performance so there are no documents / records owned by operators and helpers regarding the process of producing goods.	Standardization. Make a document in the form of a product appraisal form, where later the form will be an input for making performance appraisal document records. This aims to make it easier to see the results of production and customer satisfaction who have worked together. With this form it can help production product selection activities and product improvement proposals with minimal production (small damage).

Standard Operating Procedure Design

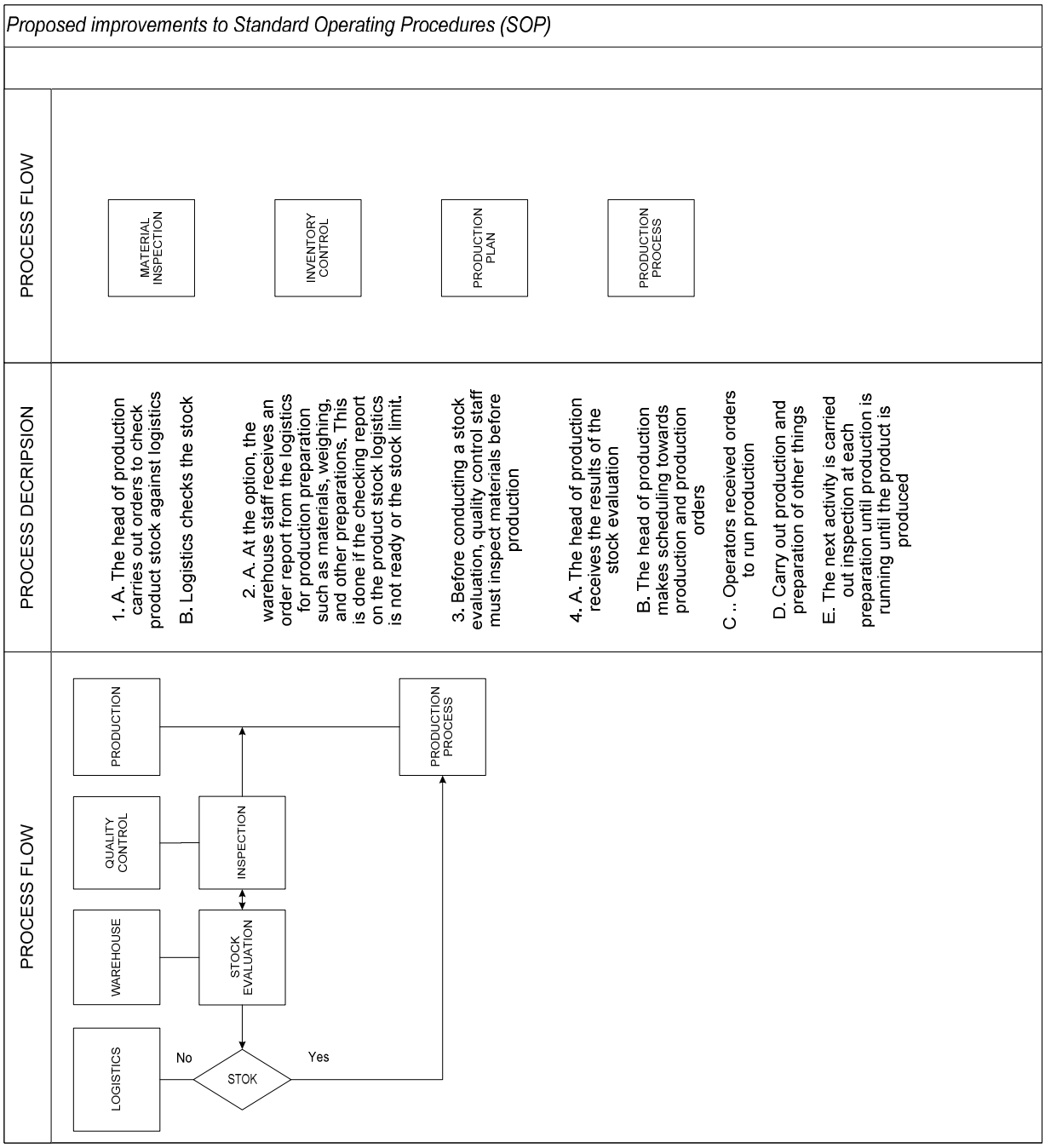

Figure 3. Image SOP of Proposed Production Process

5. Conclusion

Based on this research, it can be concluded that PT. X has a problem with decreased production. The decrease in production can be seen from the analysis of production using the BPM method. This production analysis is carried out by describing the flow of the pile-making production process then analyzed and making a design proposal with BPM. This proposed improvement is carried out as the basis for designing the proposed SOP. SOP is designed as a detailed analysis of activities during the production process. The SOP design results obtained are a reduction in time of 2 hours 40 minutes so that the production process can run more effectively and efficiently. Standard Operating Procedure (SOP) in the production process of PT. X was compiled using the Swimlane Flowchart.

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