REDESIGNING THE PLANNING AND SCHEDULING AS WELL AS THE PRODUCTION OPERATIONS PROCESS IN AVADISIA BERDIRI TEGUH

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ABSTRACT

This research aims to redesign the production planning, scheduling and production operation process in Avadisia Berdiri Teguh – that sells packaged sambal – that currently cause chaos in recording stock, overproduction and three main product quality problems: plain taste, unstable colour and short durability. This research is a qualitative research which uses interviews, documentation and observation as data collection method. Interview process involves six informants that are classified into three categories: this company's competitors, food experts and business professionals. The writers also uses triangulation technique to test validity of the result and interview guidelines to maintain the reliability. Observation was conducted by observing the competitor's production activity. The data collected were classified and analyzed to redesign the two production activities of Avadisia Berdiri Teguh in the end. Final results of this research shows that those problems could be overcomed by refining some production activity parts such as switching plastic packaging to the jar bottle, selecting the standard raw material before production and implementing standard procedure including time standard and equipment used for production. The final result is in the form of flowchart. In addition, the results shows the importance of using simple application program to record the stock of materials and finished goods. The result is expected to greatly improve the performance of this company in the future.

Keywords: company, planning, production, qualitative research

INTRODUCTION

Companies play in red ocean business must deal with many obstacles. Dealing with huge numbers of competitors selling the similar products, customers able to make fair comparison before make the purchase. (Babin & Harris, 2011). Therefore, each company needs to produce better products or services expected by customers compared to competitors.

Avadisia Berdiri Teguh that was established in June 2013 is one of the companies that enters red ocean business. This company sells packaged sambal (chili paste) with 150 gram netto with brand "Jeng Sambel". As the concequences of entering red ocean business, Avadisia Berdiri

Teguh has to deal with many competitors who sell similar products such as Sambal Bu Rudi, Sambal Dede Satoe, Sambal Tjap Garoeda and Sambal Cuk. Moreover, those competitors' sales are far higher compared to Avadisia's sales. Table 1 shows the sales data of some sambal sellers:

Table 1. Sales Comparison

Company	Sales per month in unit
Dede Satoe	± 3,333 bottles
Bu Rudy	± 40,000 bottles
Tjap Garoeda	± 12,000 bottles
Sambal Cuk	± 10,000 bottles
Jeng Sambel	± 40-60 bottles

Based on Table 1, the sales of Jeng Sambel are far below other competitors. Jeng Sambel's average sales is only 40 up to 60 bottles in a month. Thus, Avadisia Berdiri Teguh has to improve some weak factors to persuade people to purchase Jeng Sambel instead of competitors product. Therefore, Avadisia Berdiri Teguh conducted preeliminary survey to know the weakness of Jeng Sambel that may cause lower sales compared to the competitors. The preeliminary survey was conducted toward 18 customers of Jeng Sambel who has purchased more than once by asking their complaint of Jeng Sambel's product. The respondents can give more than one complaint. The result shows that the consumer's complaints about Jeng Sambel's product come from product quality and price side. It means that those two things become the main consumers' consideration in choosing the packaged sambal product. This argument is supported by research conducted by Bowo, *et al* (2013) related to consumer purchasing decison. The research examines whether brand image, product, quality and price influence the customer purchasing decision. As the result, price and product quality has the relation toward customer purchasing decision while brand image does not.

The result also shows that Jeng Sambel's current price, which is Rp 20,000.00, is not big problem for customers. Nonetheless, most of them have problems with Jeng Sambel's product quality such as plain taste, unstable colour, short durability, too greasy and less spicy. Hence, Avadisia Berdiri Teguh needs to redesign its production process to create the products ase what customers expect. Problems in taste, colour stabilization and durability are three main product quality problems that Avadisia Berdiri Teguh should refine – shown by the highest number of customer's complaint. Production process in Avadisia Berdiri Teguh is important to be redesigned because basicly, production is the most costly part in every company. Thus, each company has to learn to manage its production. By managing the production well, the company could improve its profitability and enhance its service to the society because large propotion of revenue is spent in for production activity. (Heizer & Render, 2011). A full production cycle consist of for different activities. Those activities namely; product design, planning and scheduling, production operation and cost accounting (Romney & Steinbart, 2012). In case of problem in Jeng Sambel's product quality, the related part of production cycle that needs to be redesigned is production operation process.

Moreover, Avadisia Berdiri Teguh also faces problem in planning and scheduling activity. Avadisia Berdiri Teguh sells its product through the resellers using consignment system. Selling using consignment system makes this company difficult to determine the exact number of product they should produce. This often causes overproduction. Because Jeng Sambel is a short life cycle product, the excess product that could not be sold and given back from reseller in a week has to be disposed. Yet, there is no product disposed after the production process because there has not been the defect criterias and those will be found through this research.

Table 2. Monthly Data

Month	Units produced	Units sold	Units disposed
Jan	23	20	3
Feb	84	72	12
Mar	61	53	8
Apr	54	45	9
Total	**222**	**190**	**32**

Table 2 is monthly data of the difference between the number of product produced and product sold including the value of disposal product in January-April 2015. Total units disposed are 32 units or 14.41% of total units produced. By trying to minimize total disposal product, the company decreases the need of material. Total need of material will determine how much material the company should purchase by considering the beginning material inventory. Yet, knowing beginning material inventory in Avadisia Berdiri Teguh also becomes the problem because stock recording process does not run well.

The problems mentioned before that most of the product quality do not fulfill the expectation of customer and lack of planning and scheduling including stocking system in Avadisia Berdiri Teguh lead to the interest in redesigning the planning, scheduling and production operations process in this company. This research aims to redesign production planning, scheduling and production operation process in Avadisia Berdiri Teguh. The production activities discussed in this research are production planning, scheduling and production operation only. The new process design is in the form of flowchart and focusly intended to improve three main product quality problems, minimize overproduction and solve problems of recording the material stocks.

LITERATURE REVIEW

Some previous research studies are used as supporting references in redesigning production planning, scheduling and production operation process. The research conducted by Nenni, *et al.* (2014) in International Journal of Engineering Business Management demonstrates the positive effect of lean management approach to increase efficiency, even in the company that is subject to critical market issues. The research object is pharmaceutical industry. The aim of this research is to present a case study of pharmaceutical company that has focused on efficiency improvement and collect lessons learned about the correct approach that specific industries should adopt. The method of this research is case study of pharmaceutical industry. The result

of this research is that pharmaceutical industry are successful in implementing lean management to improve its effectiveness. Those researches become a new reference for the researcher to redesign the planning, scheduling and production operation process of Avadisia Berdiri Teguh.

Operations management (OM) is the collection of many activities. The goal for performing those activities is create or add values of a product. The end result of Operations Management is output (might be another input, semi-finished good or fully-finished good (Heizer & Render, 2011). The scope of operations management ranges across the organization. The operation function includes many interrelated activities such as capacity planning, forecasting, planning, scheduling, managing inventories, assuring quality, motivating employees and many more.

Production cycle is a set of activities that runs continuously. This business activity related with production activity that manufacture product(Romney and Steinbart, 2012). Production cycle gets information used for production and the inventory level from revenue cycle and in return, production cycle sends the information to the revenue cycle about finished goods that have been produced and are available for sale. Four basic activities in the production cycle are product design, planning and scheduling, production operations and cost accounting.

Planning and scheduling are the second step in the production cycle. The purpose of this step is to create a good system in production in which company is able to provide enough product for existing demand and still able to secure some level of finished product but still minimize level of inventory (Romney and Steinbart, 2012). The primary threat in the planning and scheduling activity is overproduction and underproduction. Overproduction causes the supply of the products in excess of demands while underproduction causes lost sales and customer dissatisfaction.

Production operations is the third step of the production cycle. This activity is varies in different company, might be effected by different product or size of the company and level of technology (Romney and Steinbart, 2012). There are several threats in this production operations process such as theft of inventory and fixed assets, poor performance, loss of inventory or fixed assets due to disaster and disruption of operation. One of important tools in production operation process is Standard Operating Procedures (SOP). According to Santosa (2014), SOP is list of written activities in order to perform a production process. This set of steps must be perform in order according to the standard. By implementing the SOP means employees must follow standard rules in doing their tasks/activities. By doing so, level of error can be decrease, hence the production can be efficient and effective. (Atmoko, 2011).

RESEARCH METHODS

This research is deemed as a qualitative research. This qualitative research uses explorative qualitative approach to get broader understanding so that the new production design could be implemented well in Avadisia Berdiri Teguh. Explorative research approach is approach to develop the knowledge as the reference for the following research (Kuncoro, 2013). The subjects in this research are six informants from three different categories. They are two competitors (sambal sellers), two food experts and two business professionals. The object of this research is production planning, scheduling and production operation process of Avadisia Berdiri Teguh company. The research is using non-probability specifically purposive sampling method. According to Sugiyono (2015), non-probability sampling is sampling technique that does not give the same probability for the population to be chosen as sample.

Validity can be examined by extension of observation, amplified persistence, triangulation, negative case analysis and member-checking (Sugiyono, 2015). This research decides to use triangulation techniques. Triangulation consist of methods, theories and researches (Major and

Baden, 2010). Reliability in a research means the same reserach is consistence, either repeated in a different time period or performed by another researcher. A research consider to be a reliable one if it can be replicated by different researcher in a different time but still produce a similar result (Tracy, 2013).

FINDINGS

After gathering the data through interview, observation and documentation, the researcher has found some evaluations and suggestions regarding planning and scheduling process in Avadisia Berdiri Teguh. The triangulation result shows that the production process should be conducted regularly. It could be daily, weekly or monthly based on the need and sales of the company. Currently, Avadisia Berdiri Teguh produces its products once a week, on Wednesday or Friday. Conducting the production regularly will make the company easier to plan and schedule the production.

According to Romney and Steinbart (2012), there are two common methods that are usually used by the company in the planning and scheduling process; namely Manufacturing Resource Planning (MRP-II) and Lean Manufacturing. Internal data of Avadisia Berdiri Teguh shows that the sales of this company is 40 up to 60 bottles. In addition, this company still uses some low-capacity equipments for the production. Thus, this company is classified as small-medium entreprise. Lean manucturing itself is more suitable to be implemented in medium-small entreprise. Nevertheless, the application of this method in this company has to be adjusted because this company also sells the products through the reseller where the company does not know how many products that are going to be sold. As the solution, this company could use lean manufacturing method which delivers the product to the customers after the production yet for the consignment system, the company has to forecast the reseller sales based on the historical data of sales from those resellers.

There are two points of view to solve the overproduction solution. First, the company could boost its marketing strategy to sell some products that could not be sold by the reseller. This point of solution will not be explained more because the main focus in this research is in operational side. The second side comes from the operational side. The company could refine planning and scheduling part. This company could reduce the quantity of sambal products that will be produced in the next production. Nevertheless, reducing the quantity of sambal produced means the company has to sell the unsold sambal products in the following week. It has to be supported by longer shelf life to make the products still worthy to be sold in the following week. In addition, the company has to be able to forecast the reseller's sales by considering the season and historical sales. The solution to extend the packaged sambal shelf life will be explained in production process part. Moreover, reducing the packaged sambal going to be produced will also determine the raw material purchasing plan because raw material is one important part the company needs to prepare.

DISCUSSION

Nowadays, Avadisia Berdiri Teguh purchases the raw material such as chili, garlic and union in the morning – in the day of production – to produce the fresh raw material. After the raw materials had been purchased, it was directly used for the production. This purchasing method is also implemented by the other competitors – Sambal Bu Rudy and Sambak Cuk Surabaya. On other hand, some experts stated that this company could store the chili in the form of dry chili. This will be beneficial for the company because this company needs not to purchase the raw material every week and could purchase it in low price because this company could purchase in the bulk quantity. Yet, this company has to know the season. However, this company has to

have big refrigerator to store the raw material and the freshness of the chili is going to decrease. Hence, as the solution, it is better for this company to purchase the raw material every production process to maintain its freshness and lower the storage cost.

The other problem is the stocking system in this company has not run well. The stock card is not accounted for regularly especially for the indirect materials such as packaging. As the consequences, some of the sambal produced could not be packaged directly because the packaging has run out. This problem has to be overcomed because recording the stock is important for the company's inventory system. The rest of stock will determine when and how many quantity the company has to purchase as stated by some informants. The solution is is using the simple application program for small-medium company to record the purchase and usage of materials. by using the application program, the company could also record the sales, how many products are sold in the reseller, how many products that are given back by the reseller and how many products that are disposed. Avadisia Berdiri Teguh is suitable to use this application program to overcome the stocking system. The stocking system in the application program contains not only the stock for the materials but also for the finished product, which is packaged sambal. Consequently, the steps of recording inventory will change from manual system to the computerized system

The main product quality problems that mostly become complaint from customers regarding Jeng Sambel products are plain and unstable taste, unstable colour and short durability. There are some production evaluations and suggestions that could be implemented to overcome the production problems. They are:

1) The company has to produce with the standard measurement of raw material. If the ratio of big chili and small chili is 5 : 5, the productions have to obey that standard measurement to maintain its taste. The raw material always has to be pordered again. In addition, the company also needs to use timer to measure time of some production activities such as blendering and cooking.
2) The company has to choose the raw material especially the chili appropriately. Appropriate means the color of the chili in accordance with the standard determined the company. This is needed to minimize the unstable color. Yet, the company has to determine first the colour standard for the chili.
3) According to the owner of Sambal Cuk Surabaya, long shelf life could be gained by controlling the pH. Nevertheless, it is difficult to be applied in this company because of lack of the equipments used such as the pH meter and lack of knowledge regarding food technology.
4) Nowadays, Jeng Sambel uses plastic packaging and its shelf life is 1.5 weeks. Some food experts claimed that the shelf life of sambal using plastic packaging is indeed maximum 1.5 weeks because plastic could not be sterilized. This company will not use any preservatives in its products. As the solution, Jeng Sambel could be packaged using airtight packaging such as jar bottles. The advantage is the durability will be longer and it could be sold again in the following week if some products are returned by the reseller. On other hand, the price of jar bottle is more expensive than the plastic bottle. Avadisia Berdiri Teguh also has to consider whether the increase of packaging price still makes Jeng Sambel possible to be sold in the same price Rp 20,000.00. After calculating the cost of goods sold, the profit margin does not have major change. Therefore, this company could use jar packaging but it has to be sterilized first. In addition, the cooking process also should use small fire to make all parts of sambal cooked.

Regarding the packaging process, besides this company uses the jar bottle, the company also should use cover seal to minimize the products to spill. The sealing process could be used using iron to reduce cost. Furthermore, the sambal filling process to the packaging has to use hot filling method. Hot filling method means the products was filled to the packaging in hot temperature to decrease microbial contamination. After the products has been filled to the packaging, it has to be directly covered and sterilized.

In addition, there are several considerable inputs of production operation part that could be implemented in Avadisia Berdiri Teguh company. They are:

1) Choosing the good and appropriate raw material.
   Good means not foul. Moreover, in the beginning of the production process, the producer has also sorted again the chili and only produces sambal using the good chili. Appropriate means suitable with the products willing to produce. Related to raw material in planning and scheduling part, the colour of chili chosen has to be suitable with what the company wants to produce.
2) Managing the blendering time to create the sambal look like sambal *ulek*.
   It will take more time to produce sambal by grinding it manually (*diulek*). Consequently, the company needs blender or grinder to grind the chili. Yet, the product produced using these equipments will be too smooth like porridge. Sambal Bu Rudy and Sambal Cuk outsmart this problem by creating their own grinder so the result will be still like sambal *ulek* though they use grinder. Unfortunately, the price of customize equipment is expensive and the division of this company does not have supporting knowledge to create the equipment. Therefore, what this company could do is managing the blendering time and the quantity of chili that could be produced in every blendering section.
3) Steaming and cooking the sambal has been right process
   Before blendering the chili, this company steams the raw material first in order to be easy to blend. This activity has been right because steaming the raw material could make the materials easy to grind, maintain the color, reduce the amount of microbe, clean and inactivate the enzym. While, cooking process is conducted after the material has been grinded. Cooking process aims to make sambal have longer shelf life.

The last process after the product has been packaged is quality control. Quality control is not only done in the end of the production but it has to start from beginning of production by using the standard raw material. Standard raw material means the raw material that has been used regularly in the production. In order to maintain the quality, the company also needs to have standard recipe completed with what equipments that are used, what the brand of raw material is and how long the process is. In the end of the production, quality control is conducted by tasting sample of sambal produced. If the products are defect such as the colour is too different, the taste is too salty and it is hirst, those kind of products should not be sold and disposed.

CONCLUSION

After conducting the data collection methods and analysis, the researchers conclude that several procesesses in the planning and scheduling and the production operations process of Avadisia Berdiri Teguh company that causes overproduction, chaos stocking system, product quality problems: plain taste, unstable colour and short durability are needed to be refined. Therefore, the researchers have created new flowchart designs with several refinements for those two activities in Avadisia Berdiri Teguh. Several refinements in the new flowcharts are the usage of jar bottle as the packaging to overcome durability problem, sorting of raw materials used for

production, implementing the standard procedure including the time and equipment used to overcome plain taste and unstable colour problem and the reduction of products produced in the following week to overcome overproduction problem. Moreover, the new design is also equipped with new simple application program to record the stock of materials and finished goods as the solution of chaos stocking system.

Avadisia Berdiri Teguh has to implement the new design of those two processes to examine whether it works. Trial will cost this company both money and time but if it is successful, it will be beneficial for the company in the long run. If there are some missed out points from what is expected in this research, this company has to be flexible to redesign its two processes. While, the next researchers could analyze or evaluate the implementation result in creating better planning, scheduling and production operations in a company.

There are several parts of the company that needs the standard procedure. This research only redesigns new flowchart regarding those two activities: the planning and scheduling and the production operation process and does not explain how to apply and control those in the company. Some of ingredients and production steps are not written clearly because they are confidential for the company.

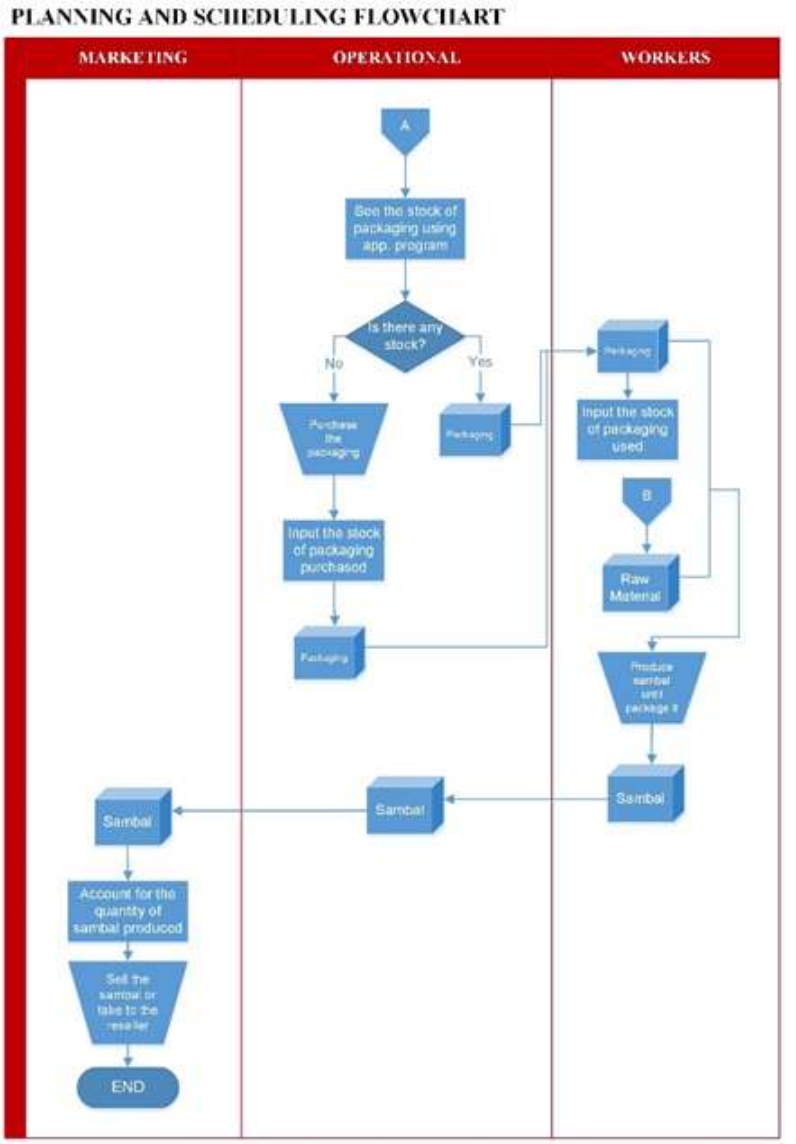

Figure 1. Planning and Scheduling Flowchart

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