

CHAPTER I

INTRODUCTION

This chapter explains the background of the research, the problem formulation, the objectives of the research, scope of study and the outline of the final project report.

1.1 Background

Globalization and the development of information and communication technology knowledge have influenced and brought implications for change and renewal in people's lives. So, the role of information and communication today is very important, even the futurists have an agreement that one of the most important strengths as a source of future power is information (Amri, 2016)

Technology plays a role in making information processing easier. Information processing is done quickly so it's provided benefits for its users. Data and information that is processed quickly, precisely, and efficiently is needed for each company or agent to increase work productivity, minimize costs and time. Companies that can implement the technology appropriately according to the system that has been used, has a great opportunity to win the competition and get excess profits.

Manufacturing companies must have a good order management system to achieve customer satisfaction (Widarda dan Fitro, 2014). Information regarding this order is needed by the production department to make a production plan to be carried out. The production plan is made based on the type of production flow is used in the company.

The company has certain production strategies in the production process. This production strategy is matched with the condition of the company. These production strategies include Make to Stock (MTS), Assemble to Order (ATO), Make to Order (MTO), and Engineering to Order (ETO). Each of these production strategies has different ways of fulfilling the orders.

Companies that use the Make-to-Order production type, produce the products after an order is made (Dhewanto, et.al. 2007). The MTO strategy has inventory but only in the form of product design and some standard raw materials according to products that have been made before. Process activities based on consumer orders. The processing activity starts when the consumer submits the required product specifications and the company will help consumers prepare product specifications, total prices and delivery times. If an agreement has been made, the company will start making components and assemble them into products and then deliver them to consumers (Istikhori, 2016).

Companies with MTO strategies have advantages in customer flexibility in determining the demand based on direct orders. The types of orders from customers are vary and fluctuate. The pattern of uncertain demand from customers, results in difficult production activities which cause disruption of order time (Istikhori, 2016).

One of the competitive keys of an MTO company is that consumers receive orders on time as promised by the company. The time of receipt of orders by consumers is called the received date (Sriyanto dan Sri Hartini, 2009). A well-received date determination must look at the production capacity in that company (Sriyanto dan Sri Hartini, 2009). Production capacity can describe the state of production that is running. If capacity is available, then the product can be made according to normal time requirements. Conversely, if the production capacity within the company is already at its limit, then the received date given will be delayed. Production capacity data must be displayed in real-time. This data will be a reference for operators who receive orders in giving the received dates to consumers.

Certainty about receive dates is a concern for MTO companies. Usually, MTO companies will provide received date information and prices when consumers place an order. To provide this information, the company must have an integrated system between the order management section and the production department. Determining the received date by the company is less accurate because it does not consider available production capacity, manufacturing time, and operating time. Companies that have a lot of orders will have problems with fulfilling orders on time.

The problems related to order completion result in delays in customer receive the orders. Based on data from the research "Identification of the Causes of Delay in The Department of Injection Molding Machine PT. XYZ " (Duarte, 2018), in 2017 the company that manufactured cosmetic packaging, cannot deliver products on time around 31%, which is 1172 products from 3737 total products. This problem also occurs in PT SP Aluminum, data from the research "Planning for Production Capacity Requirements on Aluminum SP" (Risal, et.al. 2017) explained that the company was only able to deliver products on time to four distributors from their nine distributors during December 2014. The same thing happened in the previous two months where the product could not be delivered on time to five other distributors. Research with the title "Production Capacity Requirement Planning at PT XYZ" by Hutagalung, et.al. (2013) indicating that PT XYZ during 2012, PT XYZ was unable to meet consumer demand for the spoon and fork products for four periods.

Duarte (2018) said that the inability of companies to deliver products on time was caused by various things. The poor production process, long lead time, bad order management process, insufficient capacity, and others. Risal (et, al, 2017) explains that the cause of delays in product delivery is the production floor cannot fulfill orders that given by the marketing department because the available capacity is insufficient to carry out production activities. According to Hutagalung, et.al. (2013) orders can be fully realized if supported by production capacity that is in accordance with production requirements. Products can be produced according to

the processing time if consumer demand is constant so that production activities can be predicted well. However, in companies that use the MTO strategy, consumer demand is very volatile so that in determining the time of product completion must pay attention to the available capacity on the production floor.

According to Putri, et al (2015), production capacity is influenced by several factors such as working hours, number of workers, and so on. Production capacity that is smaller than demand will result in delays in completing the orders. Risal, et.al. (2017) said that if this condition continues, the existence of the company can be threatened.

The MTO strategy is widely used in companies that are included in Small and Medium Enterprises (SME) such as companies engaged in craft, convection, furniture, etc. Small and Medium Enterprises has restrictions that are regulated by Act of Indonesian Republic No. 20 of 2008 concerning Micro, Small and Medium Enterprises. The act explains that Small Industries have a net worth of IDR 50,000,000 - IDR 500,000,000 and has 5-19 employees. The scope for Middle Industries is to have a net worth of IDR 500,000,000 - IDR 10,000,000,000 and have employees of 20-99 people.

Companies on the Small and Medium Enterprises scale always receive all orders to achieve benefits regardless of the risks or uncertainties that will be faced. Possible risks have an impact on delays in fulfilling customer orders. This delay can have a negative impact on the company. The impacts that often occur starting from the decrease in profits earned, the increase in project costs, the addition of unplanned time and the conflict between the two parties (Febrina, 2014).

Research that related to the fulfillment of order receipt time has been carried out by Kencana, et. al. (2013) with the title "Study of the Application of Load Oriented Manufacturing Control (LOMC) Methods in Fulfilling the Order Receipt Time at PT Jaya Beton". Fulfillment of order receipt time using the LOMC method which is based on manufacturing lead time calculations that consider the time of

delivery of orders to consumers, the capacity available at each work station, processing time and production flow on the production floor. However, determining the time of orders fulfillment has not considered the conditions that might happen on the production floor such as machines that are processing orders. Research related to the determination of the orders fulfillment time has been done previously (Astini, 2017) with the title "Determining the Time to Orders for Concrete Products with the Load Oriented Manufacturing Control Approach (Case Study in PT Igaras)". Determination of the order fulfillment time in this study has not been made an information system so that it cannot be accessed practically and quickly. The design of information systems in determining the timing of order fulfillment has been carried out by Sriyanto and Sri (2009) with the title "Designing Information Systems Determining Received Date in Repetitive Make to Order Manufacturing Systems (Case Study in PT Jensen Indonesia)".

Activities that run on MTO companies in SMIs are still classified as conventional. The absence of digitization results in processes that are carried out manually, such as inputting order data into a notebook. This makes companies with SMI scale have problems in dealing with the Era of Industry 4.0. Bisnis.com (2019) mentions in his article that, "The Ministry of Industry encourages small and medium industries (SMI) to adapt to digital technology in order to increase competitiveness in the Industry 4.0 era. Minister of Industry, Airlangga Hartarto said that there will be a gradual process of digital transformation in the industrial world. This does not only happen to large scale industries, but also small and medium scale industries".

Based on these problems, the need for applications that help companies manage orders. This application is expected to assist the process of digitizing MTO companies with the scale of SMEs. This digitalization allows companies to adapt to the current development of Industry 4.0. Therefore, it is necessary to develop an application that helps digitalization of the order management process and determines received dates by considering various related matters to produce accurate received dates at MTO companies.

1.2 Problem Formulation

The problem formulation in this final project is how to design an application that helps digitalization of order management process and determine accurate received dates to be applied dynamically to MTO companies?

1.3 Research Objectives

The objective of this research is designing an application that helps digitalization of order management process and determine accurate received dates to be applied dynamically to MTO companies.

1.4 Scope of Study

The scope of study in this final project are:

1. The application designed can only be used for scheduling with the type of First Come First Serve (FCFS).
2. The type of company intended for this research is a manufacturing company.
3. The design of an application is intended for Small and Medium Industries that use the MTO strategy.
4. Application designed using the PHP programming language and this application is for the internal section.

1.5 Outline of Report

The outline of report are as follows:

CHAPTER I INTRODUCTION

This chapter explains the background of the research, the problem formulation, the objectives of the research, scope of study and the outline of the final project report.

CHAPTER II LITERATURE REVIEW

This chapter contains the theories used in this study. The theories used in this study are information systems, manufacturing companies, Make-to-Order (MTO), Load-Oriented Manufacturing Control (LOMC), Agile Method, Unified Modeling Language (UML), Database, and PHP programming language.

CHAPTER III RESEARCH METHODOLOGY

This chapter contains the steps or procedures used in conducting research. The methodology in this study consisted of preliminary studies, method selection, application design, and analysis. These stages are formulated in a flowchart.

CHAPTER IV SYSTEM DESIGN

This chapter contains a discussion of application design. The design is carried out from the planning stage to the application testing stage.

CHAPTER V ANALYSIS

This chapter contains an analysis of application design which consists of application design analysis, determination of received data analysis, verification and validation analysis, and analysis of application strengths and weaknesses.

CHAPTER VI CONCLUSIONS AND SUGGESTIONS

This chapter contains conclusions about the application design carried out and suggestions for further study.