CHAPTER I

INTRODUCTION

In this chapter, the researcher will present a brief introduction which is being elaborated with the background, problem formulation, objectives, research scope, and benefit of the research.

1.1. Background

PT. Yoska prima Inti is one of manufacturing companies in good manufacturing of automotive components in metal stamping, painting, and dies and jig fixtures. In the production process of PT. Yoska prima Inti, there were several times of machine defects occurrences have ever happened. There were twelve problems that keep on reoccurring from 2016 until 2018. Those machine defects were the result of unexpected events which did not be managed properly.

The events of machine defects will also create direct and indirect impacts. Those direct or indirect and positive or negative impacts will be known as risk in industry. The risk will affect to human and environment. The negative risk is the risk that should be prevented and overcome. Through organizational point of view, this negative risk will bring business interruptions or even will also lead to business failure. Machine defects in PT. Yoska Prima Inti are known as risks that also lead on to the other risks which create disturbance to the production process and lead to disturbance in business process.

The effect of the machine defect occurrences in PT. Yoska Prima Inti are the loss in production and marketing. The loss in production happens because based on Samat et al (2012) stated that 15% to 40% of the total production cost is attributed in maintenance

activities. Those 15% to 40% of cost can either be beneficial or loss. It can turn to be beneficial if the allocated fund is efficiently and optimally useful to prevent or eliminate the problems from recurring. However, it can turn into loss if the fund is not efficiently and optimally used so that the problems are keep on persisting. In addition to the loss in production, loss in marketing can be happened. The loss in marketing happens, as the company will have to address the problems to the customers which will result on the disappointment towards the company. It can lead to the reduction in customer trust and loyalty.

In order to truly prevent or eliminate the problems from recurring, the company needs to conduct an analytical research to analyze and prevent the future risks to happen. The analysis conducted should be able to find out the real causes of why the problems happened and keeps on recurring. The real causes should be mitigated to at least able to prevent the problems from recurring. In order to identify whether the problems are optimally and effectively mitigated or not, forecasting is needed to be done. Forecasting needs to be done to know the number of future defects that may occur.

The researcher chooses to do an analytical research by combining both of Reality Charting Method in Apollo Root Cause Analysis and Auto Regressive Integrated Moving Average Method in defect forecasting within risk management sector. Apollo Root Cause Analysis (ARCA) is being used to reveal the direct and indirect real root causes to be used as an input in risk management analysis and defect forecasting. In addition, ARIMA is being used to forecast the future machine defect occurrence before the risk control and after the risk control.

ARCA method is being chosen despite of any other root cause analysis methods and tools because in comparison that has been ever created, Duphily (2014), stated that Reality Charting method in ARCA is a method with complete analysis if compared to the other RCA methods and tools such as Events & Causal Factors, Change Analysis, Barrier Analysis, Tree Diagrams, Why-Why Chart, Pareto, Storytelling, Fault Tree, and FMEA. The method used has full ability to define the problem, define all known causes, provides a casual path to root causes, delineates evidence, explains how solutions prevent recurrence, and the easiness to follow report.

Duphily (2014) mentioned that taking a comparison example for the methods, the comparison of the commonly used method or tool such as FMEA, both of them are able to define problems, but the abilities of FMEA to define all known causes, delineates evidence, and easiness to follow report are none while FMEA's abilities to provide a casual path to root causes and explain how solutions prevent recurrence are limited. In the other hand, Reality Charting by ARCA has full abilities to fulfill the comparison criteria.

Haiges (2017) stated that there are multiple models which can be used for forecasting items such as time series, regression, econometric, decomposition, co-integration, ARIMA, artificial systems such as the Artificial Neural Network (ANN), Grey prediction, Input-output, Fuzzy-logic, and the bottom-up models. The ARIMA model has gained extensive literature in defect forecasting, owing to its complex and reliable approach. It is also found suited for long term projection. Furthermore, in order to avoid a spurious or invalid forecast, ARIMA is a recommended approach since it is widely established.

To sum of everything, in order to be able to use the result of root cause analysis in risk management to create solution to prevent the similar or same risks to be happened in PT. Yoska Prima Inti, the needs of clear and full root cause analysis is needed. In addition to make sure that the risk control is suitable, defect forecasting is going to be conducted. Hereby, the researcher use Reality Charting by ARCA to conduct the root cause analysis and ARIMA to conduct the forecasting.

1.2. Problem Formulation

Based on the background above, the problems that should be formulated and generated are shown below:

1. What is the machine defect root cause analysis in production process of PT. Yoska Prima Inti based on analysis using Reality Charting by ARCA?

2. What are the solutions and recommendations to mitigate or eliminate the future risks?
3. How is the defect forecasting using ARIMA?
4. What is the effectiveness of the risk control analyzed by creating the defect forecast?

1.3. Research Objectives

Based on the problem formulation above, the research objectives are as follow:

1. Assessing machine defect data in production process based on analysis using Reality Charting by Apollo Root Cause Analysis.
2. Providing solutions and recommendations to mitigate and/or eliminate the future machine defects of PT. Yoska Prima Inti.
3. Analyzing the risk control using defect forecasting by ARIMA method.
4. Finding out the effectiveness of the risk control.

1.4. Research Scope

The research scope has a function to limit the research in order focus the study. Below is the research scope:

1. The research is in knowledge base of Risk Management, Root Cause Analysis, and Forecasting.
2. The research is being conducted at PT. Yoska Prima Inti.
3. The method that will be used is Reality Charting by Apollo Root Cause Analysis and ARIMA.

1.5. Research Benefits

The research is expected to increase the knowledge, particularly in Risk Management and Reality Charting by ARCA and forecasting by ARIMA. The other benefit of this research

is to enhance the application or usage of Reality Charting by ARCA and forecasting by ARIMA in industrial practical problems.