

CHAPTER I

INTRODUCTION

In this first chapter, there will be a brief introduction, which elaborate the background, problem formulation, purpose, scope and benefit of the research, as well as the systematical writing.

1.1 Background

The global change of economic, social, political, and environment condition give affect directly in industry and company. Many companies suffer some problems starting from small problem such as decreasing profit until bigger prolem that can lead the company to the bankruptcy. It is happened because the companies cannot adapt the situation and analyze risk that occured in the company. Chang et al. (2010) said to maintain the competitive edge of an enterprise, the way is guaranteeing the product quality, cost and timing can all fit market demand. This means that the operations and performance of the company must always be controlled and controlled. This is because improving the performance of the company's operations can affect a company in getting profits. Many methods have been used by companies in improving performance and operations. According to Pugna et al. (2016) improving the performance and operational of a company can be conducted by implementing different quality improvement initiatives like Total Quality Management, ISO certification, Agile & Lean manufacturing. Besides that, one of theory that start to emerge is the Enterprise Risk Management (ERM).

. Nocco et al. (2006) said the concept of Enterprise risk management is capability of corporation in manage risk in two fundamental different ways. The first is manage risk at a time, on a largely compartmentalized and decentralized basis or by manage all risks viewed together within a coordinated and strategic framework. In another term enterprise risk management explained as form of planning, organizing, leading, and controlling the activities of an organization in order to minimize the effects of risk on an organization. Enterprise risk management scopes are risks associated with accidental losses, financial, strategic, operational, and other risks.

Batik Sogan as one of the companies engaged in batik manufacturing certainly has several risks that must be considered. Examples of possible risks that can occur in Batik Sogan are work accidents due to human error or damage to the machine used during the production process, design errors that can slow down the production process, and supplier delays in sending raw materials needed by Batik Sogan. The risks that exist in this company can have a variety of impacts on the way the business process. The resulting impact can be in the form of a small impact such as reduced profits in the company, or a large impact such as experiencing losses in the company. To reduce the chances of these risks, companies must find ways to keep the risk under the control. One method that can be used in this case is risk management. Risk management aims so that the company can still achieve its objectives while still keeping the risk under the control. Risk management can be conducted by looking for the risks that exist in the company to further determine its risk priority. After that, some recommendations will be given to minimize the probability of risk occurring. This is expected to reduce the likelihood of occurrence of risks to companies that can hamper business processes. According to the expert in Batik Sogan, the company will loss up to 2% from the profit each month. One of the loss that experienced by Batik Sogan is from the products that get returned by the customer. From 900 products there are more than 10 products that got returned by the customer.

Enterprise risk management concept is come from ISO 31000: 2009 which explains the principles and guidelines in implementing risk management. ISO 31000:2009 certification use to certifies or as agreement that a management system, manufacturing process, service or documentation procedure has all the requirements for standardization and quality assurance.

Until now, the concept of risk management in ISO 31000: 2009 became a guideline in improving a company because the risk management itself is developed based on the conditions that exist in the company. Gehner (2008) said that the effective of risk management will support a sound decision making, which is improve company's performance by improving the precision in balancing the tradeoff between risk and expected return.

Based on Mohammed et al. (2016) risk management is an effective method that applied in order to decreasing or alleviate unwanted effects of exposures and helps to earn optimum benefit from risky situations. The basic concept of risk management is to identify risks that must be mitigated by performing a calculation for subsequent concrete decisions. Many tools and methods was developed to identify risk management by quantitative or qualitative explanation. The quantitative method, there are Decision Tree, Simulation and many more. For the qualitative methods there are Delphi, HAZOP, FMECA, Risk Matrix Chart, House of Risk (HOR) One of mostly method that used in enterprise risk management is FMEA (Failure Mode Analysis) because In this failure mode and effect analysis (FMEA) is a systematic technique for identifying, prioritizing and acting on potential failure modes before the failures occur Chen et al., (2009).

In this research, the method to be used is FMEA (Failure Mode Effect Analysis). FMEA focuses on anticipating and preventing possible risks from occurring. FMEA method will find out the risks of what might happen in the future to further determined the risk priority of each risk. Each risk will be determined by the value of severity, occurrence and detection level score. After determining risk priority, the next thing to do is to provide suggestions for risk mitigation. Researchers choose this method because the risks that will be the case are the risks that predicted by the expert will be an obstacle to business processes in the future. Therefore, the FMEA method is a sufficiently appropriate method to prevent these risks from occurring.

Kang (2017) explained in the journal of Food Control that conduct research about risk assessment through a modified Failure Modes and Effects Analysis (FMEA) method. The research prupose is study the connection between failure modes and its effect on the failure probability of the entire system. Moreover, Trafialek et al. (2014) was also conduct research

using FMEA method that study about design the HACCP system audit method which allows precise assessment of the system functioning in practice.

In the implementation, there are several weaknesses in the FMEA method (Kumru et al., 2013). The assumption that the RPN elements are equally weighted leads to over simplification. It neglects the weight among *O*, *S* and *D*. The three factors are assumed to have the same weight. This may not be the case when considering a practical application of the FMEA process. The RPN scale itself has some non-intuitive statistical properties. Shaghghi et al. (2012) Different combinations of *O*, *S* and *D* may produce exactly the same value of RPN, but their hidden risk implications may be totally different. For example, two different events with the values of 2, 3, 2 and 4, 1, 3 for *O*, *S* and *D*, respectively, have the same RPN value of 12. However, the hidden risk implications of the two events may not be necessarily the same. In this case, FMEA needs a method that can supports in determining the risk priority. Maheswaran et al. (2013) To make the meaningful evaluation of RPN, few authors proposed FMEA with Multi Criteria Decision Making (MCDM) techniques. Multi Criteria Decision Analysis (MCDA) with risk assessment provides better-supported techniques for the comparison of alternatives based on decision matrices, and it also provides structured methods for the ranking of alternatives. Risk assessment alone can't reduce the risk effectively; Risk assessment along with decision making gives effective risk management.

One method in the multi criteria decision making that can support the FMEA method in this study is the TOPSIS method. TOPSIS was first introduced by Yoon and Hwang in 1981 to be used as a method in solving multicriteria problems. TOPSIS provides a solution of a number of possible alternatives by comparing each alternative with the best and the worst alternative alternatives among the alternative problems. The reason for choosing the TOPSIS method is because of the weighting of each criterion. This is very necessary to support the FMEA method in which there is no weighting in each criterion. In addition to the calculation process, criteria are differentiated according to their respective attributes, namely benefits and costs. This makes the criteria that will become the calculation input become more specific. Last, in the TOPSIS method there is an euclidean calculation of the distance of each alternative from the positive and the negative ideal solution. Nur (2014) TOPSIS assumes that each criterion will be

maximized or minimized. Therefore the value of positive ideal solutions and negative ideal solutions from each criterion is determined, and each alternative is considered from that information. Positive ideal solutions are defined as the sum of all the best values that can be achieved for each attribute, while the negative ideal solution consists of all the worst values achieved for each attribute. This will make the ranking process at risk more accurate. Based on the expert, the accuracy of the method is up to 70%. This can be seen based on the risk priority result. The expert believes that the results of the ranking at each risk are quite appropriate for the company.

1.2 Problem Formulation

Based on the description in the background above, the problems that come up in the research would be formulated and generate a research question as follows:

1. What are the risk factors that probably occurred in the expected company?
2. How is the risk priority of the company based on FMEA-TOPSIS method?

1.3 Objective Research

This paper is created to fulfill several objectives as mentioned as follows:

1. To identify the risk events that probably occurred in the expected company.
2. To find and determine the risk priority using FMEA supported by TOPSIS method.

1.4 Scope of Problem

Scope of problem is a restriction or limitation of problems to make a border in the research in order to keep the research inside the scope. There are some limitations as follows:

1. This research uses FMEA method supported by TOPSIS method as a tool in analyzing the problem.
2. The research will be conducted in small and medium enterprise (SME) in Yogyakarta.

1.5 Benefit of Research

Based on the purpose of the research, this paper is developed to give contribution as below:

1. To conduct the research in analyzing and determining the risk that occur in the expected company.
2. To know the mitigation or recommendation for the risk that occur
3. To be contributor in development of knowledge.

1.6 Systematical Writing

Writing this study was based on the rules of scientific writing in accordance with the systematics as follows:

1. CHAPTER I INTRODUCTION

This chapter consists of background problem, formulation of the problem, research question, problem limitation of research, the objectives or purpose research, the benefits of research and systematic writing.

2. CHAPTER II LITERATURE

In this chapter elaborated on the theories of reference books and journals as well as the results of previous research related to the research problem which is used as reference for problem solving.

3. CHAPTER III RESEARCH METHODOLOGY

Consist of description of the framework or concept, line schedule of research, and the methodology in conducting the research.

4. CHAPTER IV COLLECTION AND PROCESSING DATA

Contains the data obtained during the research and how to analyze the data. Data processing result is displayed either in the form of tables and graphs. What is meant by processing the data also includes analysis of the results obtained. In this section is a reference to the discussion of the results to be written in Chapter V.

5. CHAPTER V DISCUSSION

This chapter Contains discussion of the results of data processing that has been done in research, compatibility with the objectives of research so as to produce a recommendation.

6. CHAPTER VI CONCLUSION AND RECOMMENDATION

This chapter consist of conclusion the research and added with the recommendation for the future research.

REFERENCES

APPENDIX