EXAMINING THE IMPACT OF ADOPTING LEAN PRODUCTION IN BAKERY INDUSTRIES

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APPROVAL

We hereby declared that we had read through this thesis and
in my/our opinion that this thesis is adequate in terms of scope and quality which
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I hereby declared that this thesis entitled

"EXAMINING THE EFFECTIVENESS OF LEAN IN IMPROVING PRODUCTION LINE OF BAKERY INDUSTRY IN MELAKA"

is the result of my own research except those as cited in the references. This thesis has not been accepted for any degree and is not concurrently submitted by candidature of any other degree

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DEDICATION

I would like to dedicate a lot of appreciation to my family, friends, lecturer, and others who educated me and motivated me to finish my final year project and give me a lot of advice throughout this research. I am cannot finish this final project without their blessing and support.

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ABSTRACT

Lean production (LP) has been showing significant progress in the recent years. LP is a technique utilised to continuously eliminate all types of waste in the production process to improve efficiency. Manufacturers are eager to adopt LP principles to eliminate waste and remove non-value activities from the factory floor. Hence, labour and machinery can focus entirely on value-added activities in the production process. Many manufacturers have implemented LP techniques, but studies on the impact of adopting lean production in small-sized industries such as in the bakery industries have not been thoroughly investigated. The purpose of this study is to explore the adoption of lean production among selected bakeries using qualitative case study methodology. Data were collected through interviews and analyzed to identify the main factors that emerged from the interview data. The respondents were asked about their experience and application level of LP and the benefits that occurred in LP implementation. The results from the interviews shown that the application of LP by the studied bakery companies obliged them to consistently systemize their production procedures. However, this is found to be a time-consuming process, especially for a small-sized bakery company since they need to review the Standard Operating Procedure (SOP) for production consistently. The respondents also stressed that they need to update their workforce competence and maintaining discipline. Despite that, the study clearly shows that the LP gives an overall positive impact on process ratio, production time, process inventory level, production line speed and maximize the productivity of the workforce. It also helps the bakeries to satisfy their customers in terms of the product cost, service quality and delivery.

Keywords: Lean production, bakery industry, production line.

ABSTRAK

Pengeluaran Lean (LP) telah menunjukkan kemajuan yang ketara pada tahun-tahun kebelakangan ini. LP adalah teknik yang digunakan untuk terus menghilangkan semua jenis sisa dalam proses pengeluaran untuk meningkatkan kecekapan. Pengeluar tidak sabar-sabar untuk mengadaptasi prinsip LP untuk menghapuskan sisa dan mengeluarkan aktiviti tidak bernilai dari lantai kilang. Oleh itu, buruh dan jentera boleh memberi tumpuan sepenuhnya kepada aktiviti nilai tambah dalam proses pengeluaran. Banyak pengeluar telah melaksanakan teknik LP, tetapi kajian tentang kesan penggunaan pengeluaran Lean dalam industri bersaiz kecil seperti dalam industri roti masih belum diselidiki dengan teliti. Tujuan kajian ini adalah untuk meneroka penggunaan pengeluaran Lean di kalangan bakeri terpilih menggunakan metodologi kajian kualitatif. Data dikumpulkan melalui temu bual dan dianalisis untuk mengenal pasti faktor utama yang muncul dari data temuduga. Responden ditanya mengenai pengalaman dan tahap aplikasi LP dan manfaat yang berlaku dalam pelaksanaan LP. Hasil dari wawancara menunjukkan bahawa penerapan LP oleh perusahaan roti yang dipelajari telah mewajibkan mereka untuk secara konsisten mengatur prosedur pengeluaran mereka. Walau bagaimanapun, proses ini mengambil masa yang, terutamanya untuk sebuah syarikat roti bersaiz kecil kerana mereka perlu menyemak Prosedur Operasi Standard (SOP) untuk pengeluaran secara konsisten. Responden juga menekankan bahawa mereka perlu mengemaskini kecekapan tenaga kerja mereka dan mengekalkan disiplin. Walau bagaimanapun, kajian ini jelas menunjukkan bahawa LP memberi impak keseluruhan positif kepada nisbah proses, masa pengeluaran, tahap inventori proses, kelajuan talian pengeluaran dan memaksimumkan produktiviti tenaga kerja. Ia juga membantu kedai roti untuk memuaskan pelanggan mereka dari segi kos produk, kualiti perkhidmatan dan penghantaran.

Kata kunci: Lean pengeluaran, industri roti, barisan pengeluaran,

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TPS	Toyota Production System
TPM	Total Productive Maintenance
SOP	Standard Operating Procedure
VSM	Value Stream Mapping
JIT	Just-In-Time
CSL	Customer Services Level

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter will consisted of background of study, problem statement, research objectives, research question, scope of study, limitation of study, significance of study,flow of study and summary. This chapter has explained the surface of this research.

1.2 Background of Study

This research focused on the application of lean system in improving the production line of the bakery industries located in Melaka area. This research will be conducted in Malaysia within SMEs companies in the bakery industries.

Lean is an approach that can apply in the production line to have a systematic flow of production while minimizing waste. In meanwhile, this approach also can fulfill the customer demand even with minimum cost. (Ramezani & Madhloo, 2014). This research will show how the overall lean is to work in the bakery industry to improve its production line. This research also focused on the bakery industry because there is no research yet that related to this industry. Although, this research also will prove that the lean system is not focusing on manufacturing industries only. It also can be applied in the small-medium industry such as the bakery industry.

Besides, lean can be defined as a tool that provided continuous improvement in managing the organization. By using the lean system, the company can reduce many wastes to occur in the organization especially in the production line. It also can add value for customer satisfaction in terms of high quality of product with a short time (Ulla Lehtinen & Margit Torkko, 2005). At the first place, the lean system is used in

the manufacturing industry, but currently, the system also used in the non-manufacturing industry (Alaa Aljunaidi & Samuel Ankrah, 2014).

As the lean system also practices by the non-manufacturing industry, this research will be conducted to investigate the relationship between the lean system and production line of the bakery industry. In twenty-one century, bakery industry found their place in the market where it produced a variety of product (Mr. Aleksandar Marić, et al, 2009). Therefore, lean can be implemented in the production line of the bakery industry to sustain its market. Also, lean applies to all industry that has the production line even the production is in small production.

By using lean, this industry can improve the production line by reducing waste and minimize the production line. In producing a product, the company needs to fulfill customer satisfaction from the quality of the product itself. Therefore, the processes occur in production depend on customers. In the other hand, during the implementation of lean, the production line might have a few changes in terms of benefits of lean.

1.3 Problem Statement

The lean approach is related to the production line where the production area needs to develop a system to have a systematic production flow. Lean can be defined as a tool that provided continuous improvement in managing the organization. By using the lean system, the company can reduce many wastes that occur in the organization especially in the production line. Nowadays, the production area usually unable to sustain their productivity due to the system that implements in the organizations. Although lean approach is used in the manufacturing industry, it also can be implemented in the non-manufacturing industry (A.Aljunaidi & S.Ankrah, 2014) such as the bakery industry.

The unsystematic production line was the main problem in the bakery industry where the production process occurs might not add any value to the end product. The system in the production line is the most important part to sustain the productivity of a product. In the bakery industry, the flow of the production area is the main role to ensure that the process of production is going smoothly. It is important to provide a good quality of the product for the customer. By implementing lean in the production line, it can make the production flow more systematic. On the other hand, lean also can help production to reduce the waste that occurs in the production area. After all, lean implementation aims to eliminate wastes that occur in the production area. (U.Lehtinen & M.Torkko, 2005).

Also, the implementation of the lean system was usually unable to sustain in the production line. It is because of the lack of lean knowledge among employees. Lean knowledge was not fully utilized by the employees in the organization. The employees might think that lean is the only system that needs to implement in the production line whereas lean knowledge among employees also plays the main role to make the production line smoothly running. To implementing lean in the production line, employees need to know detail about lean approaches. R.Salem (2015) has stated that lean awareness is important during the implementation of lean in the organization. Hence, the reason for this research is to ensure that all employees in the organization of the bakery industry know about lean before implementing the system in the production line.

1.4 Research Question

Researchers found that many problems need to be answered related to the research title. Nowadays, entrepreneurs in the bakery industry need to choose the best system to use in the production line. So, there are a few questions have been made to solve these issues.

1. What is the difference between two bakery companies that implement lean system in production line?
2. What are the benefits of lean in improving production line of bakery industry?

1.5 Research Objectives

The purpose of doing this research is to study the system and production line use in pastries industry currently. The specific objectives of this research are as follow:

1. To compare understanding of two bakery companies that implement lean system in production line.
2. To identify the benefits of lean in improving production line of bakery industry.

1.6 Scope of Study

This research will be conducted at two companies in the bakery industry allocated in Melaka area. The topic for this research will focus on the effectiveness of lean in improving the production line of the bakery industry. The reason for chosen this topic because the researcher wants to gain further understanding of the effectiveness of lean implementation. It will involve two bakery companies in Melaka which is Apple Bakery and Italy Bakery as the respondent will be the employees of the company from a different year of working experience. It will include the combination of interview sessions and observation in the production line in the bakery. The result will be the performance of the production process in the bakery industry.

1.7 Limitation of Study

This study was consists of several limitations and problems. This study was conducted qualitative method which is the data collection is through an interview session and observation of industry. During the interview, the data is less precise depends on the company involved in the interview. Time constraint also considered as a limitation of this study because it depends on company free time. Besides, the respondent might not fully understand the needs of this research conducted due to the language used by both researchers and respondents.

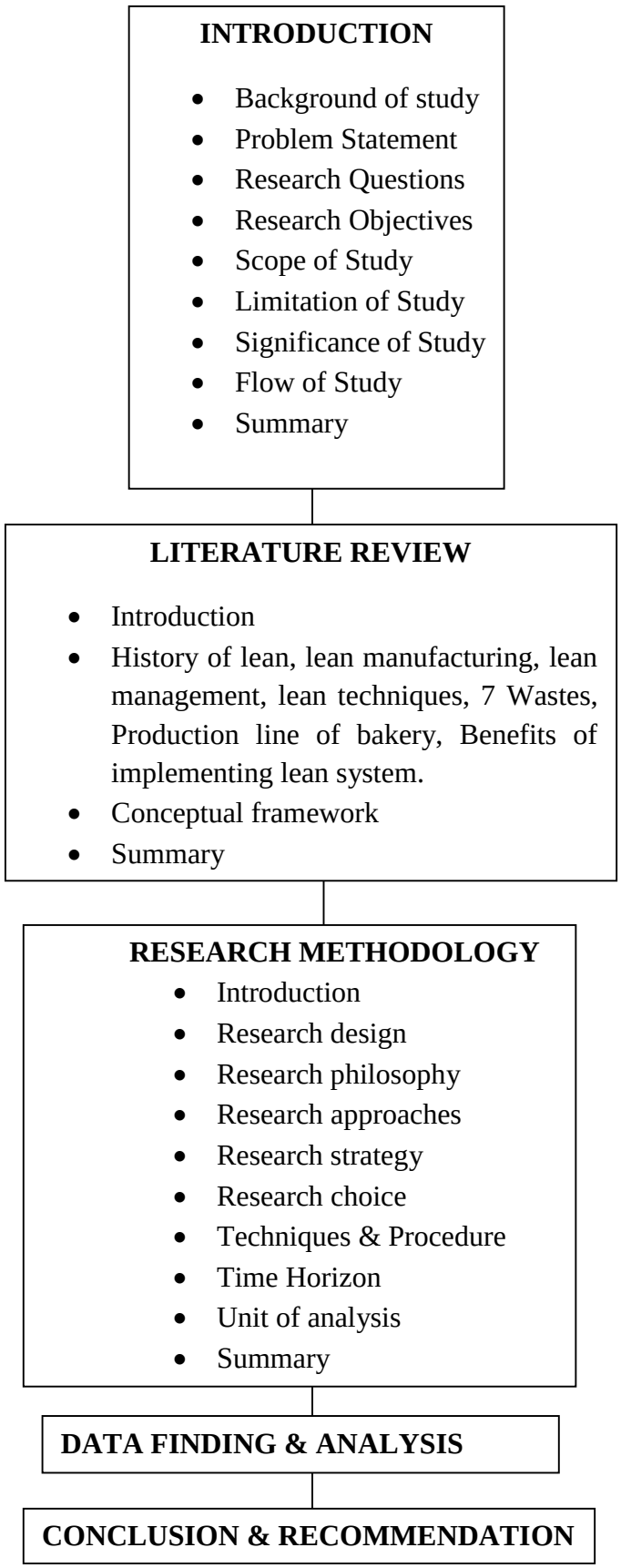
1.8 Significance of Study

This study was intended to figure out the impact of adopting lean production practices in bakery industries. This study was beneficial to identify the understanding between two bakery companies that implemented lean system in their production line. It also highlighted the benefits of using a lean system to improve the production line.

The literature review was presented in the next chapter with the overview application of the lean system, production line of bakery companies, benefits of implementing a lean system that most important to apply to improve the production line. It was then followed by the research framework on the application of the lean system in improving the production line in the bakery industry.

Besides, the performance of the production line is important to study because it also contributes to the economy nowadays. So, the system applied in production line in bakery companies was the main role that can lead to a high quality of product and services. Plus, this research also will be referenced for bakery companies to enhance the performance of their production line.

1.9 Flow of Study



1.10 Summary

The whole chapter is discussing the brief introduction of the content of the research that will be referred later in upcoming chapters. The chapter consists of a background of the study, problem statement, research question, research objectives, scope and significance of the study. For the next chapter, the content of this chapter is elaborated into a literature review and the proposed theory for the research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review presented the perspective of the researcher from previous research and regarding Literature to the topic of the application of lean in improving the production line in the pastry industries. Since most of the study related to lean in the manufacturing industry, there is still no research yet in bakery companies about the application of the lean system. This chapter consists of a history of lean, lean manufacturing, lean management, lean techniques, 7 wastes, the benefit of implementing lean, theoretical framework and summary.

2.2 History of Lean

The philosophy of Toyota Production System or lean manufacturing was introduced by a Japanese company since 1940. At first, lean was only implemented in the manufacturing industry which is involved in mass production. However, in the present day, many industries already implement lean practices especially in services and the public sector industry. (dos Reise Leite, et al, 2015).

Samuel Lueng (nd) also has indicated that lean was developed by Taichii Ohno from Toyota Motor Company which is he went to US to study about the Ford assembly line system in their production. Therefore, he recognizes that the techniques apply during the production applies to any industry. Hence, the lean practices develop by Mr. Taichii Ohno was intends to create continuous improvement by eliminating waste and maximizing the production flow. (Kovacheva, 2010).

In 2015, Dr. Mahmoud Abbas published a research in which described that Toyota Production System (TPS) or lean focusing on continuous improvement while creating various techniques to simplify the process in production. Besides, it also needs to have respect for humans in the organization to run the production smoothly. It is because the human capability equally essential to improve productivity. (Antony Pierce & Dirk Pons, 2012).

2.2.1 Lean Manufacturing

TheMachine that Change the World is a book created by James p. Womack, Daniel T. Jones, and Daniel Roos have stated about lean manufacturing between Japanese and American companies. (Lukasz Dekier, 2012). Lean manufacturing is also known as lean production is a tool that significantly used in improving the performance of the production line. The main objective of lean is to eliminating waste and maximizing the flow in production.

According to Kovacheva (2010) defines that lean manufacturing is a method to reduce the excessive cost and production process but still able to fulfill customer demand with a high quality of the product. Lean also provides various techniques to improve the production to achieve efficiency in the organization. Besides, in a study by Yaqian Wang and Tony Huzard (2011) has stated that lean is also applicable to all kinds of industries and not only focusing on the manufacturing industry.

AbuShaaban (2012) has pointed out that lean manufacturing also defined an approach that used to eliminating non-value added activities in production by producing the product according to the order received from customer demand. In his research, he identifies that the systematic system will fulfill customer satisfaction by giving a product with zero defects.

Besides that, lean manufacturing is devoted to making the production flow smooth by reducing waste and increased productivity with minimum cost. (N. Nordin, et.al, 2010). Thus, lean manufacturing added five principles to make the tools better

functioning during the implementation. There are five principles of lean manufacturing:

i)Value

The first principle suggested an organization to define the value in customer perspective in a certain product. Value means what customers willing to pay for it. To define what kind of value, an organization can apply techniques such as surveys and interviews. Hence, the organization can determine the value that can give satisfaction to the customers. The value also includes the price, specialty of product, services, etc.

ii)Value Stream Mapping

The second lean principles are identified and mapping the value stream. Value stream mapping is a qualitative tool that can be used to describe in detail how the facility should operate to create systematic flow. An organization must identify the process of making the product from the beginning until the product ready to deliver to the customer. Furthermore, the actions also need to consider the non-value added time and value added time. The organization can reduce and eliminate waste in production by determining the necessary and unnecessary processes in production.

iii)Create Flow

The next step in lean principle is to ensure that the remaining process or step runs smoothly without any delays. In this principle, the organization must know how to ensure the transformation in the production going well and the remaining value activities can be combined to achieve the best result. (Pedram Mirzaei, 2011).

iv)Establishing Pull System

Prof Peter Hines, et al (2000) claims that the pull system is one of the lean strategies used to eliminating waste in the production process. This system is focused

on the production of the product which means the product only can be produced once the organization received orders from customers. The product pulled from the production process by customer demand.

v)Pursue Perfection

The last principle of lean is constantly perfecting the process which is the organization needs to make continuous improvement for the remaining process in production. By implementing the principle properly, the organization can enhance the competitive advantages of the organization.

2.2.2 Lean Management

The origin of lean management is from the management philosophy of Toyota Production System (TPS). Lean management focused on improving the process, speed, and quality through the elimination of wastes. Lean tools consist of 5s methodology, Kanban, JIT, TPM and more. According to P.Arunagiri (2015), lean management also used to understand customer value and react to continuous improvement in the process.

Lean management provides practice that can develop an organization to understand its main problem in management. The difference between lean manufacturing and lean management which is the management focused on in-tangible improvements such as long-term approach, efficiency, and quality. To improve management by using lean, there are a few skills need to implement in the organization. The following:

i)Communication

Zareen Husain, (2013) indicated that communication is important in improving the management of the organization. It was important to have good communication between top management and employees so that the company can define the problem