

THE IMPACT OF LEAN MANUFACTURING TOOLS ON ORGANIZATIONAL
PERFORMANCE IN MANUFACTURING INDUSTRY

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I hereby acknowledge that this project paper has been accepted as part of fulfilment for
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DEDICATION

I would like to appreciate the dedication of my beloved family members who educated me and motive me to learn until this level, the lectures and friends who give me support and advice throughout the research. Without their blessing and encouragement, this research is impossible to complete in short period of time.

DECLARATION

I hereby declare that the work have been done by myself and no portion of the work contained in this research project proposal has been submitted in support of any application for any other degree or qualification of this or any other university or institute of learning.

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ABSTRACT

In today world, the adaptation of Lean Manufacturing Tool has been recognizing the essential effect on the continuous improvement activity in manufacturing sectors. The purpose of this study is to examine the impact of lean manufacturing tools towards organizational performance in manufacturing industry in Melaka, Malaysia. This research used explanatory research as research design to meet the research objectives. Data was collected from the 253 respondents who work in the manufacturing industry through questionnaire survey. Statistical Product and Service Solution (SPSS) Version 25.0 was used to analyze the data collected. Multiple regression analysis is being used to test the relationship between independent variables and dependent variable. The results from the multiple regression analysis and correlation analysis showed that the organizational performance can be influenced by the four independent variables. Lastly, 5S and Kanban has a strong positive relationship towards the organizational performance. Hence, through this study, the researcher can conclude that Kanban is the most effective tool towards organizational performance in manufacturing industry.

ABSTRAK

Di dunia hari ini, penyesuaian Alat Pembuatan Lean telah diiktirafkan sebagai kesan yang penting terhadap aktiviti peningkatan berterusan dalam sektor perkilangan. Tujuan kajian ini adalah untuk mengkaji kesan alat pembuatan lean ke arah prestasi organisasi dalam industri perkilangan di Melaka, Malaysia. Kajian ini menggunakan penyelidikan penjelasan sebagai reka bentuk penyelidikan untuk memenuhi objektif penyelidikan. Data dikumpul daripada 253 responden yang bekerja di industri pengilangan melalui tinjauan soal selidik. Penyelesaian Produk dan Perkhidmatan Statistik (SPSS) Versi 25.0 digunakan untuk menganalisis data yang dikumpul. Analisis regresi berganda digunakan untuk menguji hubungan antara pembolehubah bebas dan pemboleh ubah bergantung. Hasil daripada analisis regresi berganda dan analisis korelasi menunjukkan bahawa prestasi organisasi dapat dipengaruhi oleh empat pembolehubah bebas. Terakhir, 5S dan Kanban mempunyai hubungan positif yang kuat terhadap prestasi organisasi. Oleh itu, melalui kajian ini, penyelidik dapat menyimpulkan bahawa Kanban adalah alat yang paling berkesan terhadap prestasi organisasi dalam industri perkilangan.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Lean manufacturing (LM) OR Toyota Production System (TPS) was firstly identified by an automotive company in Japan, Toyota in the year of 1950. Lean manufacturing was conveyed across countries and industries because of its global superiority in cost, flexibility, quality and rapid respond (Schonberger, 2007). Fundamentally objectives of lean manufacturing were to deduct the production cost and enhance the productivity by decreasing wastes or activities that not added value. (Womack, Jones and Roos, 1990). It is design to reduce waste in all area from production to product design, customer relations, factory management and supplier networks. The goal of lean manufacturing is to incorporate less inventory, less human effort, less time to develop, and less space to become highly responsive to customer demand as well as produce best quality products in the most efficient and economic manner possible (Papadopoulou and Ozbayrak, 2005).

Lean manufacturing become an important tool which have been use across the industry in the recent scenario. Nowadays, there are many industries are facing a high level of competition due to the globalization. Hence the companies need to develop certain techniques and tools which are useful to enhance their performances and it also need to respond rapidly to the customer's needs in order to remain and compete in the market. By providing a quality product and ensuring the product does not cost too much to customer is the fundamental concept of lean manufacturing (Sundareshan, 2015).

In today world, the adaptation of Lean Manufacturing practice has been recognizing the essential effect in manufacturing sectors for the continuous improvement activity. This philosophy has provided an evidence to produce a high quality work environment by enhance the capability in managing overall manufacturing operations. For example like increase the ability to manage the negative effect from manufacturing activities on the environment in order to produce a high quality working environment (Demeter and Matyusz, 2011). The lean manufacturing implementation is highly recommended to investigate and reduce wastes (RviKumar, 2011). Therefore, the elimination of eight wastes involved in lean manufacturing such as defects, waiting, over-production, motion, over-processing, inventory, transportation and correction (Shah and Ward, 2007). Lean manufacturing is a set of tools and methodologies that purpose for the continuous elimination of all waste in the production process (Abd El-aty, 2013). There are some technique and tools that target to improve the operational performance of organization which comprised under the lean strategy's umbrella (Bhasin, 2012). Just-In-Time (JIT), total productive maintenance (TPM), autonomation, value stream mapping (VSM) and kaizen/continuous improvement (CI) are the most significant method of the lean approach (Rocha-Lona, Graza-Reyes and Kumar, 2013).

Lean manufacturing tools brings positive impact towards organizational performance. For example, lean is a famous concept for improving operational performance in production environments (Cua, Mckone and Schroeder, 2001; Shah and

Ward, 2003). In additional, there were several studies stated that lean will bring positive impacts on financial performance (Claycomb, Germain and Droge, 1999). Besides, numerous studies conclude that Lean Manufacturing helped several companies to improve performance through waste elimination. Several studies postulated in the operations level, Lean Manufacturing has become a dominant method in accelerating performance of operations in term of quality (Shah and Ward, 2003; Fullerton and Wempe, 2009), inventory minimization (Chong, White and Prybutok, 2001; Fullerton and McWatters, 2001), delivery (Ahmad , Mehra and Pletcher, 2003; Ahmad, Schroeder, Sinha, 2004), productivity (Fullerton and Wempe, 2009; Singh, Garg, Sharma and Grewal, 2010), and reduction of cost (Cua et al., 2001; Hallgren and Olhager, 2009).

1.2 Problem Statement

According to the Sweeney (2017) stated that LNS research, a research and advisory firm which help companies to achieve operational performance found out there were minimum 61 percent of manufacturers had establish or planned to establish the lean manufacturing which starting in the year of 2014. Moreover, there are also 29 percent of the total number of manufacturing professionals surveyed said that they would wholly shift to lean manufacturing process and more than half also said that they would try to implement lean method in their lean manufacturing group.

Besides, according to the Ministry of International Trade and Industry (MITI) in 2015, the Deputy Minister of International Trade and Industry stated that lean management helps the sectors to eliminate the waste and boost customer value and enhance the work flow. This is because the public and private sectors have a record that

savings of RM323 million through different initiatives to improve the productivity and innovation in last year. In the year of 2017, the minimum labor productivity growth of 3.7% is targeted in the implementation of Malaysia Productivity Blueprint. According to the news from Federation of Malaysia Manufacturers (FMM) stated that the continuous improvement is supported by the long term lean management approach which systematically seeks to achieve incremental changes in process in order to improve efficiency especially in quality. Besides, by implantation of lean also allow companies to overcome the challenges for example like reduction of inventory, cycle time, delivery lead time, defects, improve prod+uctivity, efficiency and quality improvement.

Most of the previous studies that done by the other researcher is focused on one or two lean manufacturing tools, such as the research study which conducted by Singh, Gohil, Shah and Desai (2013). The lean manufacturing tools that applied in this research included 5S and kaizen that helps to reduce breakdown time and improve the performance efficiency. According to Assad, Saad and Yusoff (2015) the research is to identify the level of implementation of two lean manufacturing tools such as 5S and kaizen in Malaysia automotive companies. This research have resulted that 5S and kaizen is a lean manufacturing tools that can enhance organizational performance.

Further, to the best of my knowledge, fewer previous studies have focused on combination of four lean manufacturing tools towards organizational performance. This study more specifically contribute to the understanding of the four lean manufacturing tools by explaining on how its impacts on organizational performance.

1.3 Research Question

This research is to study on the impact of lean manufacturing tool on organizational performance in manufacturing industry. Research question shown as below:

- What is the impact of lean manufacturing tools toward organizational performance in manufacturing industry?
- What is the most effective lean manufacturing tool towards organizational performance in manufacturing industry?

1.4 Research Objective

This research purposely is to examine the impact of the lean manufacturing towards organizational performance in manufacturing industry. Research objectives as below:

- To determine the impact of lean manufacturing tools toward organizational performance in manufacturing industry.
- To determine the most effective lean manufacturing tool towards organizational performance in manufacturing industry.

1.5 Scope and Limitation of Research

This research was focused to examine the impact of Lean Manufacturing Tools towards organizational performance in manufacturing industry. To smaller the scope of findings, the researcher will conduct this study in the state of Melaka, Malaysia. The researcher will target on employees in manufacturing industry as respondents of the study.

The limitation of this research is the researcher might face problems in attaining data from the manufacturing industry that already practice lean manufacturing in their organization. This is because some data are highly confidential and they might be not willing to share with the researcher for the aim of this study.

1.6 Key assumption of the study

There are certain key assumptions of this study. First, the researcher assumed that the respondent for the study will answer the questionnaire distributed by honestly and accurately. Besides, the researcher assumed that the respondents have sufficient knowledge to be a part of respondents for the data collection. Lastly, the researcher assumed that the respondents to have experienced which enabling to answer this research topic by giving the reasonable answer.

1.7 Significance of the study

This study aims to examine the impact of lean manufacturing tools towards organizational performance in manufacturing industry. This research pursued to understanding the impact of four lean manufacturing tools towards organizational performance.

1.8 Summary

The finding of this study will emphasize on the impact on lean manufacturing tools towards organizational performance. This chapter explains on the background of study, problem statement, research questions, research objectives, scope and limitation of the study, the key assumption of the study and the significant of the study. The literature review will be explaining on the next chapter of this research topic and also the proposal of its framework.

CHAPTER 2

LITERATURE REVIEW

2.1 History of Lean

The history of lean was first identified after Second World War in Toyota Motor Company in Japan. The idea is to eliminate the cost in management model (Wahad, Wukhtar and Sulaiman, 2013). In the late 1940s, Japanese country was experiencing difficulties of man power availability and financial assistance. After the Second World War, Taichii Ohno and Eiji Toyoda developed Toyota Production System (TPS) that can improve the quality of product by requiring less resources and man power. Hence, the Japanese industry started to manufacturer products with high quality and less cost (Naga, Rambabu, 2014). Since the history of lean has its origin in the industry of Japan, the modern manufacturing techniques and principles in a product and technology-driven industry has been succeed in Japanese. Manufacturing industry of USA and Europe have firstly adopted these principles and techniques and it is adjusted and developed to fit the environment and culture in Japan, which coming out of the TPS (Liker, 2003). After

review of the TPS, the term of “lean” was firstly introduced as the “Lean Production System” by John Krafcik. In the book of *The Machine that Changed the World* by Womack, Jones and Roos in 1990, the “Lean Production System” was later on popularized as “lean manufacturing” and was first widely developed in manufacturing companies. Lean manufacturing has been further adapted and used for various sectors for example like healthcare, military and public organizations (Liker, 2006).

2.2 Lean Philosophy

There are some elements that can describe the lean philosophy. The first element is customer first. The quality is defined by the internal and external customer whereas the customer is to define the value so if there is no added value to the customer it can be considered as a waste. Besides, the results that created by the process must be focus on the customer in order to create value by the customer (Salcudean, 2009; Sandu and Caras, 2013; Vladutescu, 2014). To create a fear-free environment is the second element of lean philosophy. The change is inhibited by fear when a person is drive into a defensive posture; it prevents the elimination of waste. Never stop improving is the next element of lean philosophy; lean is an ongoing incremental improvement. Thus, it is always needed to search an opportunity for improvement. In addition, create a shared vision also considered as one of the element in lean philosophy. It is needed to build an understanding of the interdependencies between groups because lean involve everyone in the organization (Tenescu and Teodorescu, 2014).