

# Selection of Lean Practices, Company Sizes and Corporate Culture: A Mini Review

Falah Abu<sup>1</sup>, Muhamad Zameri Mat Saman<sup>2\*</sup>

<sup>1</sup>Department of Applied Sciences, Universiti Teknologi MARA (UiTM), Shah Alam, Malaysia

<sup>2</sup>Department of Manufacturing and Industrial Engineering, School of Mechanical Engineering, Universiti Teknologi Malaysia (UTM), Johor, Malaysia

## Abstract

The purpose of this paper is to address the accompanying lean manufacturing (LM) implementation barrier issues and their future outlook. In the article "An SEM approach for the barrier analysis in lean implementation in manufacturing industries," the barriers that hinder the implementation of lean manufacturing are discussed based on three factors; culture and human attitude, knowledge, and resources. The authors examine why Small and Medium Enterprises (SMEs) companies refuse or are unable to implement lean using the wood and furniture industries as a case study. This mini review summarizes the reasons for not implementing LM practices from the perspective of LM practice selection and contextual factors.

**Keywords:** Lean manufacturing • Lean implementation • Barriers

## Introduction

Lean Manufacturing (LM) research has evolved over the past 30 years and is applicable to all business sectors, both private and public [1]. Scholars from a variety of research fields have tried to explain the motives, barriers, challenges, and the applications of LM [2]. By investigating the relationships between culture and human attitude, knowledge, and resources barriers, Abu et al. [3] proposed several activities for the LM implementation so that SMEs can experience and quantify the positive impacts of lean practices. However, to date, the adoption of LM remains unpromising, hence, persuading the wood and furniture companies to adopt LM is challenging [4]. Most of the SMEs were unsuccessful because they were unable to address the accompanying issues and challenges [5]. With businesses closing, disruptions in the supply of wood raw materials as a result of the COVID-19 pandemic, globalization of sustainability issues, and a fiercely competitive environment [6], lean and fourth Industrial Revolution (IR 4.0) transformations are likely to become even more important. Therefore, it is crucial to-

- Identify which is the most suitable and beneficial LM practices for the companies and
- Analyze the effects of contextual factors (company size and ownership) on LM implementation.

## Literature review

### LM practices

A survey study was conducted by four researchers to determine the most beneficial and least difficult LM practices. They used a scale of most to least used LM practices to conduct a frequency ranking position. The ease of use of the LM practices from different research backgrounds is

presented in Figure 1. Each ranking consists of 14 to 20 lean practices. Firstly, Pirraglia et al. [7] ranked the use of LM practices among secondary wood manufacturers from the Wood Component Manufacturing Association (WCMA) in the United States (U.S.). The relationship between the size of the companies and the level of improvement was then examined. Kaizen was amongst the top five most used LM practices in the wood industry [7], but it was ranked last by companies that used LM practices the least as found by Vilkas et al. [8]. Panwar et al. [9] indicated that LM practices such as 5S, Total Productive Maintenance (TPM), and continuous improvement do not require much investment in terms of time or money. They are easy to use because these tools are not industry specific and do not necessitate small-batch production. Nonetheless, they contribute significantly to waste reduction and quality control. The authors ranked the LM practices in order to correlate the most important LM practices with the size of the company and the level of LM awareness in Indian process industries. During the lean transformation, new businesses were advised to start with 5S, TPM, and visual control.

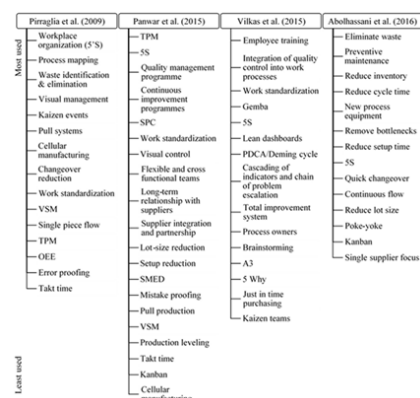


Figure 1. Most popular LM practices based on the number of frequencies used.

\*Address of Correspondence: Muhamad Zameri Mat Saman, Department of Manufacturing and Industrial Engineering, School of Mechanical Engineering, Universiti Teknologi Malaysia (UTM), Johor, Malaysia; Email: zameri@utm.my

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Received: 28-Jun-2021, Manuscript No. JBMR-22-001-PreQc-22; Editor assigned: 05-Jul-2021, PreQC No. JBMR-22-001-PreQc-22 (PQ); Reviewed: 20-Jul-2021, QC No. JBMR-22-001-PreQc-22; Revised: 18-Jul-2022, Manuscript No. JBMR-22-001-PreQc-22 (R); Published: 01-Sep-2022, DOI: 10.37421/ 2223-5833.2022.12.448.

Thirdly, Vilkas et al. [8] surveyed Lithuanian companies which had implemented LM to identify the most popular LM practices used. According to the authors, the companies frequently implement employee training, quality control integration into work procedures, gemba, and the 5S based on the ranking of usage. This is because, by doing so, they are able to increase operational performance associated with leanness i.e. increased efficiency, on-time delivery of order and services, and decreased unnecessary movements and ineffectiveness. Abolhassani et al. [10] identified waste elimination as the most valuable and easy to use LM practice. The authors looked at how LM practices were implemented in different facility sizes and for different lengths of time in Pennsylvania and West Virginia, as well as the challenges that came with implementing those practices. From the finding, reduced setup time was listed as the most difficult LM practice to be implemented. The LM practice was applied by companies that have been practicing LM for 11 to 15 years. Moreover, the results showed that 82% of the top management has fundamental insights about LM and that 67% actively practiced LM as part of the ongoing improvement programme. Overall, three research studies performed by Pirraglia et al. [7], Panwar et al. [9] and Abolhassani et al. [10] used company size as the factors to measure the successfulness of LM implementation. In addition, it is interesting to examine the influence of company ownership from the perspective of Malaysian society. Moreover, Marodin et al. [11] suggested that the contextual factors can be tested as mediators if there is empirical evidence of their effect on LM practices.

### Company size (number of employees)

Malaysia's wood-based industry had been one of the major revenue contributors to the country's economic growth, over the past two decades. Malaysian exports of wood and wood products are expected to reach RM22 billion in 2020 (approximately 5.3 billion US dollar). Wooden furniture accounted for 48.3% of the total, while plywood accounted for 12.9% [12]. There are approximately 240,000 workers in this industry with the biggest furniture hub located in Muar, Johor. Generally, wood and furniture companies in Malaysia are categorized as SMEs which have 5 to 75 number of employees. There is a statistical difference in the frequency of LM practices implementation between small, medium and large companies [10]. According to Pirraglia et al. [7] there is a relationship between company size and the adoption of LM practices. Most studies concluded that larger companies are more inclined to adopt LM practices as compared to medium and smaller companies [11, 14]. For example, 85% of valid responses from medium and large companies indicated an average of 3 years of LM implementation [15]. In fact, some researchers tend to exclude small companies or limit the respondents for medium to large companies, which have a higher tendency to implement LM practices [15-17]. This is due to the fact that large corporations have more resources to engage public-sector partners in the LM process [7]. As a result, large corporations with more expertise and resources are more eager to implement more LM practices [10].

Medium and small businesses, on the other hand, lack critical resources such as capital, competencies, technology, relevant knowledge, and information to run their businesses more successfully [18]. According to Marodin et al. [11], medium and small-sized companies are more similar in terms of LM implementation as compared to large-sized companies. Even though large-sized companies use LM practices more, smaller firms can better convert them into performance [14]. However, Panwar et al. [9] cited that there is no evidence of LM implementation in small companies and concluded that the small companies refuse to adopt LM. Thus, Marodin et al. [11] suggested that medium and small-sized companies must adapt the LM implementation approach which may be different than those of large-sized companies.

### Ownership

Malaysia is a multicultural country with Malays (Bumiputera), Chinese, and Indians, according to corporate culture. The goal is to see which companies have a higher proclivity to implement LM practices. Most of

Malaysian SMEs are managed and controlled by the Chinese community [19]. Undeniably, they can lead to better organizational performance, especially when it is moderated by the Chinese practice of guanxi [20]. Furthermore, Tehseen et al. [18] found that there are positive impacts on the performance of all four types of companies run by Chinese entrepreneurs compared to others. In comparison, only a small number of indigenous or Bumiputera SMEs are able to sustain in the wood-based product manufacturing industry in Malaysia [21]. However, several studies had provided statistical evidence for the positive influence on companies' performance among Malay entrepreneurs [22]. In comparison to Bumiputera and Indian companies, Chinese companies may have a higher tendency to implement lean practices, but there is variation.

## Discussion

In terms of LM practices, the frequency of LM adoption is different in every research. For example, TPM was listed at the bottom four of the least used LM practices in the research by Pirraglia et al. [7], but Panwar et al. [9] identified TPM as the most used LM practice by companies due to its cost advantage. Industries could increase customer satisfaction, improve quality, eliminate waste, decrease production cost, and increase demand management efficiency after implementing LM [9]. However, the manufacturing systems must first ensure their capacity in accepting the LM methods prior to applying any LM practices to succeed in the long-term [10].

Another aspect to be considered is the classification of the company sizes. To complicate matters, the small, medium and large-sized companies are also subjected to the description of SMEs in the country that the research is being conducted. For example, Shah and Ward [14] defined small companies as those with less than 250 employees. In contrast, Marodin et al. [11] considered small companies to have less than 100 employees; Pirraglia et al. [7] less than 80 employees; Abolhassani et al. [10] less than 50 employees, whilst in the Malaysian context it refers to companies with 5 to 75 employees.

## Conclusion

To the best of the current authors' knowledge, the frequency of lean practices will increase with the increase in company size. Considering the above discussion, the influence of size is pervasive and most of the studies concluded that size matters. There are very strong arguments that large-sized companies are persistent in LM implementation, but the difference between medium and small-sized companies remains unclear. While the times were difficult and resilient for the wood and furniture industry, it is anticipating more companies to implement LM and to cope with the challenges of the new digital technology.

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**How to cite this article:** Abu, Falah, and Muhamad Zameri Mat Saman. "Selection of Lean Practices, Company Sizes and Corporate Culture: A Mini Review." *Arabian J Bus Manag Review* 12 (2022): 448.