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KNOWLEDGE TRANSFER IN LEAN MANAGEMENT: EXPERIENCE FROM MALAYSIAN SME

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ABSTRACT

This study explores how SME develops knowledge transfer in Lean management, particularly lean tacit knowledge. Lean tacit knowledge is very significant in ensuring the success of lean management implementation, yet the SMEs often found difficulties due to limited capital and resources. A single case study of Malaysian SME in the automotive industry was selected for this purpose. Results show that lean training, problem solving using case study, factory visit, sharing of lean database and online learning are the common approaches used by the studied company in developing the lean tacit knowledge. Moreover, the accomplishment of this knowledge transfer in lean management necessitates strong commitment from the employees and the top management support. This study incorporates some practical implications for the organizations that aim to implement lean management effectively.

Keywords: Lean management, lean tacit knowledge, automotive industry, SMEs, case study.

INTRODUCTION

Lean management is widely pursued globally as an effective way to reduce the waste, while effectively managing the resources, improving the performance and becoming more competitive (Zhou, 2016). In the era of digitization that powered by Industrial Revolution 4.0, Lean management is viewed as a significant enabler for IR4.0 (Mayr et al., 2018). Thus, embracing lean management is a highly necessary strategy for any company that aims to remain competitive in the changing business landscape. Moreover, adopting lean management in the automotive industry is exceptionally important, given that the fundamental is originated in the Toyota

production system (TPS), where the effectiveness has been proven for decades and is being recognized as the best practice for the automotive companies.

Despite this concern, implementing lean management should be given substantial attention, because not all companies could implement it successfully. The scholars argue that ambiguity about how to develop lean knowledge is one of the main factors that hamper the success of lean implementation (Kumar & Kumar, 2014; Nordin, Mohamed, Uchihira, 2019). Given that there is a dearth of research that attempts to explore lean practices in SMEs (Hu, Mason, Williams & Found, 2015), insights about how the knowledge transfer takes place in assisting the effective implementation of lean management in SMEs is still unclear. Therefore, this paper aims to explore how SMEs organize the knowledge transfer about lean, particularly lean tacit knowledge development in their organization.

Lean Management

Lean Management (LM) is a great buzz in the industrial companies and disseminating widely to other sectors, such as service and construction (Asnan, Nordin & Othman, 2015). The significant phase of lean discovery can be traced back to the 1970s when Toyota Production System (TPS) was gaining interest as a hallmark of good Japanese Management practice in the manufacturing (Stone, 2012; Wagner, Herrmann & Tiede, 2017). TPS underscores the importance of waste elimination and defines waste as everything that did not create value, which includes overproduction, waiting for work, conveyance, wrong work, inventory, motion and rework (Wagner et al., 2017). Liker (2004) explained that TPS can be represented by a house diagram, in which it describes the important structures in LM, as shown in Figure 1.

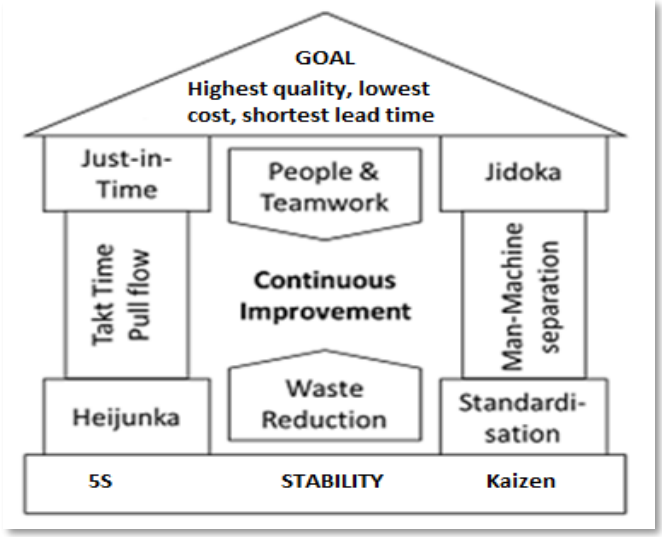

Figure 1. *The house of Toyota Production System (adapted from Liker, 2004)*

Accordingly, TPS starts with the goals of best quality, lowest cost, and shortest lead time the roof. The most important pillars are just-in-time (JIT) and *Jidoka*, which simply means never

letting a defect pass into the next station and freeing people from machines automation with a human touch. At the heart of the system are people. This explains that only through continuous improvement the operation can ever attain this needed stability. Hence, people must be trained to see waste and solve problems at the root cause by repeatedly asking why the problem really occurs. Problem solving is at the actual place to see what is really going on. Finally, it includes various foundational elements, such as the need for standardized, stable, reliable processes, and also *Heijunka*, which means leveling out the production schedule in both volume and variety. A leveled schedule or *Heijunka* is necessary to keep the system stable and to allow for minimum inventory. In a nutshell, the concept of LM goes beyond the set of tools to be deployed to reduce waste, but indeed is a set of principles, philosophies and business processes to enable the implementation of it. Along with this view, the article defines LM as a management approach that aims for efficiency, enhancing quality and overall performance (Zhou, 2016).

Lean Management in SMEs

LM often seen as a common practice in large companies, due to the capacity of resources that they have to dedicate to LM implementation. In the automotive industry where LM is 'a must' practice in the large companies, quality excellence and highly capable business process are greatly emphasized, the practice of lean inherently spread throughout the supply chain, including the SMEs. Thus, to secure the business and remain competitive, SMEs are intensely pressurized to implement LM and sometimes mandated by their customers along the supply chain (Hu et al., 2015; Rose, Deros & Rahman, 2013). In view of this concern, SMEs often found difficulties to implement LM due to some constraints, which include lack of management commitment and resource availability (AlManei, Salonitis & Xu, 2017). Nevertheless, Mrugalska and Wyrwicka (2017) pointed out that SMEs also have some advantages that could support LM, as shown in table 1.

Table 1.

Advantages of SMEs and large companies in lean implementation (Mrugalska & Wyrwicka, 2017)

SMEs	LARGE COMPANIES
• Ease and speed of changing organizational culture • Fast decision making • Less layers of management • High level of innovativeness • Simple, clear, and direct communication • Close to customers and faster feedback • Flexibility • Easier implementation of multifunctional teams, quality circles, total productive maintenance • Strong staff loyalty	• Access to resources • Experienced and/ or expert staff • Experience in in-house lean or continuous improvement, understanding their potential benefits, processes, requirements and challenges • Applicability of tools • Negotiating power over suppliers to develop lean supply chain easier

Therefore, it is evident that SMEs need to capitalize on their strengths to pursue LM. According to Zhou (2016), SMEs that managed to implement LM successfully were reported to yield benefits similar to large companies, such as improvement in productivity, profitability, quality and customer satisfaction, while gradually reducing the inventory cost and waste. On the other hand, there are also numerous cases where the LM effort was not fruitful. It is a tough and complex journey because LM is a new management philosophy that affects all aspects in the organization (AlManei, Salonitis & Xu, 2017). Among others, the failures are due to misunderstanding about the real concept and purpose of LM (Baker, 2002; Taj, 2005) which consequently could lead to greater major issues such as misapplication of lean tools (Pavnaskar, Gershenson, & Jambekar, 2003). Therefore, the knowledge component appears to be a crucial issue in LM, and worth substantial attention in addressing the success of LM implementation.

Knowledge Transfer and Lean Tacit Knowledge Development

Knowledge is broadly categorized as explicit and tacit knowledge (Nonaka, 1991). Explicit knowledge can be codified; typically articulated in words, figures, and numbers, hence more objective and relatively easy to share. In contrast, the tacit knowledge is more subjective, difficult to codify, context-specific and normally based on individual experiences (Anand, Wald & Totikonda, 2010). In the context of LM, explicit knowledge includes Statistical Process Control (SPC), failure mode and effect analysis (FMEA), single minute exchange of die (SMED), fool proofing or poka-yoke, and value stream mapping (Herron & Hicks, 2007). Spear and Bowen (1999) contend that the tacit knowledge can be captured in four basic rules; which are to guide the design, operation, and improvement of every activity, connection, and pathway for every product and service. These rules provide guidance on how people connect (connections), how the production line is constructed (pathways), how people work (activities), and how to move forward (continuous improvement). Meanwhile, tacit knowledge is personal knowledge, a deep understanding of context, know-how, and it is usually difficult to communicate. It develops during extended periods of time, therefore relatively more personal and unique. In knowledge management literature, it is often referred to as “know-how”, thus the hard to imitate nature of the tacit knowledge could be a strategic competitive advantage to the organization (Nahapiet & Ghoshal, 1998). Thus, the success of lean management implementation depends on the capture of both explicit and tacit types of knowledge. Among the two, tacit knowledge is more important owing to its “know-how” contribution towards continuous innovation (Tyagi, Cai, Yang & Chambers, 2015).

Developing lean tacit knowledge such as continuous improvement or kaizen, Total Productive Maintenance (TPM), Kanban, 5S, standardized working, and policy deployment (hoshin kanri), are the techniques that are difficult to implement without the right support. Transferring tacit knowledge takes a long time because it often requires a change in culture and substantial experience to be gained (Recht & Wilderom, 1998). Despite some difficulties, Muniz et al. (2010) argue that the tools will increase the creation and operation of a favorable context for the use of the operator's knowledge. What important most, the SME need to strategize on how to develop lean tacit knowledge within the best of their capability.

METHODOLOGY

This study uses a single case company of a Malaysian SME in the automotive industry. A case study approach was pursued since it allows for better illustration of how the lean tacit is developed in a particular company, especially when the study requires close interaction with practitioners who deal with real management situations (Gibbert, Ruigrok & Wicki, 2008). The studied company was selected based on the willingness to participate and the experience that they had in implementing lean initiatives. Principally, the company must fulfill three main criteria set earlier; 1) it must apply lean management, (2) must have lean department or unit, and (3) included in Malaysian Automotive Institute (MAI) database. Company A is a company fully owned by Bumiputera, established since 1992 in Shah Alam, and one of the main suppliers to Proton and Perodua. The data collection started by contacting the company to be studied to gain their cooperation, and explained the purpose of the study. Two respondents were agreed to participate in this study. The first respondent holds the position of Deputy Manager, with 5 years of working experience in the company. The second one is the Assistant Manager of Production Planning and Engineering, who has 9 years of working experience in that company. The researchers conducted a semi-structured interview with the participants, and interview protocol was used as a guide to avoid any bias

RESULT AND DISCUSSION

The data collection gathers important insights pertaining to the question "how the lean tacit knowledge was developed in the organization?" Accordingly, the results were presented in the following table.

Table 2.

Mechanisms of lean tacit knowledge development

Mechanism	Description
Lean training	Training is essential to develop the required knowledge and skills for lean management implementation. The training conducted not only focused on how to perform lean on the production site, but it is also stressed on the proper use of tools, methodologies and practices during lean management implementation in the organization.
Case study	Case study is used for the practical application of lean knowledge which was conducted after received the training. It is to gain precise knowledge of lean concepts and techniques during lean management implementation. Case studies illustrate the true picture of how to apply lean implementation effectively. The best example of doing case studies begin with value stream mapping (VSM) where it shows the whole area before the implementation of lean management in the organization.
Factory visit	Factory visit is one of the best ways to increase employees' knowledge of lean management implementation from other organizations. The visits were held on the manufacturing floor or the warehouse to observe the actual lean implementation in the successful

	companies. Knowledge will be created when the employees observed how lean can be applied and the approaches that they used in their lean implementation. Thus, skills and understanding of lean knowledge could be gradually developed.
Sharing lean database	Sharing lean database with other lean practitioners that have successfully implemented lean is one of the ways to build lean thinking and skills. The respondent shared the lean database with their friends who are skilled and have an understanding of lean implementation such as on lean practices (Kaizen, Kanban, and etc.) and on how to eliminate waste in the production line. The information gained through the sharing can help workers to increase their understanding of getting ideas on how to practice lean in their operation.
Online medium (website, Youtube)	The internet is used as a medium for learning lean management. Internet resources such as the website or YouTube have helped the respondent to get knowledge to implement lean. the lean knowledge that was uploaded on the Internet network makes it easier for the respondent to assess the information quickly. The information obtained not only involves the implementation of lean principles, but it includes the proper implementation methods. Therefore, they can take the ideas to be applied in their company.

Table 2 signifies that the lean tacit knowledge in the corresponding organization was developed via five main mechanisms; namely lean training, case study, factory visit, database sharing and online sources.

Among others, lean training appears as the most important mechanism to acquire lean knowledge. According to Arnheiter and Maleyeff (2005) employee training is important to maintain the employee's effectiveness which includes various problem-solving skills. This is further assisted through the formation of a lean expert team to disseminate the knowledge to other employees. The respondents are among the lean expert team who acts as a change agent and train others. In this manner, the knowledge transfer process will be progressed, thus enhance success in lean implementation (Mostafa, Dumrak & Hassan, 2013).

Besides, the respondents reiterated the use of case study as a significant means to enhance problem-solving skill, and this approach normally assisted by the consultant from Japan. through case study, employees learn how to solve problems using the techniques from the Toyota Production System. This is aligned with what Gabriel (1997) had pointed out that case study approach could promote understanding about the concept and philosophy of lean management. Hence, the lean knowledge and skills gradually improved and continuously implemented in the company. Similarly, Tyagi et al. (2015) also maintain that employees have to indulge in a hands-on experience in order to gain tacit knowledge because it is very difficult or nearly impossible for anyone to learn and develop 'know-how' skills just by reading or by watching audio/video media.

Meanwhile, the respondents claim that learning from other people's best practices is also significant in developing their knowledge. Through factory visits, they could directly observe how lean is implemented in other successful companies. According to Moriarty and Smallman (2009) benchmarking exercise promotes organization learning, since the focus should not be on bluntly copying others but rather learning and adapting. Indeed, benchmarking approach is widely recognized as a sound practice for companies to learn and improve their performance (Marie et al., 2005).

Likewise, sharing lean knowledge based on the database from other practitioners is also the best way to develop lean tacit knowledge. This agrees to Charron et al. (2014) who emphasize that lean knowledge sharing is critical to the successful knowledge development of a Lean management system. Finally, lean tacit knowledge is also developed by means of online learning. The online platform has been very efficient in providing various resources for lean knowledge, such as YouTube, articles and websites. Consequently, the lean knowledge expands, and could generate various ideas to increase productivity.

In sum, the case study has found various means on how the organization could develop lean tacit knowledge in supporting their lean management. Thus, it is proven that despite having various constraints, SME can also afford to implement LM successfully if they are highly committed, adopt the right practices and adjusted it according to their own needs and capabilities. As such, organizing an effective knowledge transfer mechanism is a fundamental platform to ensure the success of LM, particularly in SMEs. This is because successful companies are often characterized by their ability in exploiting the knowledge in an efficient manner (Tohidinia & Mosakhani, 2010).

CONCLUSION

This study intends to explore how SME organizes the knowledge transfer about lean, particularly the lean tacit knowledge development in their organization. A case study of SME in the automotive industry was performed in order to accomplish this objective. The results reveal that are various affordable mechanisms to develop lean in SME, such as lean training, problem solving using case study, factory visit, sharing of lean database and online learning. Hence, knowledge transfer about lean can be organized within the organization's capacity, and selective according to their needs. This conveys the practical contribution to SMEs that aspires to implement LM successfully, by emphasizing the importance of knowledge transfer mechanism to be organized throughout the organization. Consequently, the success of LM implementation will encourage more SMEs to be optimistic in pursuing LM and reap the resulting benefits.

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