

CHAPTER II

LITERATURE REVIEW

In this chapter, will be explaining the literature review studies which divided into two, inductive and deductive. Inductive study is a study from previous research that already has reputation. Besides, deductive study is study that would be explain about the basic theory that has relation with research derived from the text books, etc. Inductive and deductive study need to be done to find out the gap between previous study and the current to avoid the plagiarism. This literature review will be divided in to several sub chapters.

2.1 Empirical Study

Based on previous literatures. the studies related to implementation of lean into SMEs and service sector already existed, but the implementation of lean in laundry industry is not yet conducted. There are many previous researches only study related to lean implementation in manufacturing sector, public service organization, third party logistic, health care, insurance company, etc.

Study conducted by Singh et al. (2011) performed a case study of an Indian SME to evaluate the effect of the SMED technique in reducing setup time. They identified that SMED along with other lean tools, like 5S and Poka-yoke, reduce cycle time significantly and also render financial benefits.

Mathur et al. (2012) reported significant improvement in productivity through implementation of Single minute exchange of die (SMED) tool in an Indian make to order (MTO) SME. They also argued that due to poor literacy and insufficient expertise of the labor force working in most of the SMEs, lean techniques which ask for mathematical and statistical analysis creates hurdles in adoption and advocated for the tool which is simple, easy to demonstrate and apply. The performance measures should play an influencing role, rather than an informing role, and act as the guiding force of corporate strategy.

Asnan et al. (2015) argued that many public service organizations were unable to fully implement and sustain lean. Thus, change management is needed by addressing the resistance, provide support, and develop required knowledge to implement change. This paper reviewed lean implementation in public service and the importance on applying the change management in lean transition. Lewin's Change Management Model is used as guide in change management aspects. This study found that by managing the issue in change and preparing a complete change program can help in ensuring the lean implementation process in service sector move smoothly and successful.

While study conducted by Staudacher (2010) on third party logistic companies and seven companies of the financial sector through interview and found that there are two key elements in Lean implementation: the need to address the issue at a single process level, highlighting the fact that service companies start from high volume, low variety processes, which are focused on the back office. This study also found that third party logistic companies, that process a physical product, are more advanced in Lean implementation than banks and insurance companies (financial services).

Alsmadi et al. (2012) had made an empirical attempt to analyze the difference in the relationship between Lean practices and firm performance in the UK manufacturing and service sectors. Although Lean practices have been successfully implemented in

many manufacturing cases, their effect on firm performance in both the manufacturing and service sectors is still limited. First, the empirical findings, in both sectors, suggest that Lean practices are positively associated with firms' performance and the degree of impact on performance is also identical between the two sectors. Therefore, this study supports the positive argument concerning the applicability of Lean practices in service firms and their potential effect on performance. Second, the results did not allow us to affirm that all the Lean practices were adopted in the same manner in both sectors, the manufacturing sector was found practicing hard practices such as TPM and set-up time reduction. On the other hand, the service sector was outperforming in soft Lean practices like those related to customer and HR management.

A study conducted by Zhao et al. (2016) presented the first stage of the integration of these lean approaches in services jointly deployed with a knowledge management perspective. After action review (AAR) is used for analyzing the network surrounding the department. This study proposed the application of linkage between service waste with lean methodology and knowledge management.

Study conducted by Cohen (2018) about the application of lean methodology in health care, is trying to explain lean as a quality improvement method that permeates many sectors of business and health care due to its success in the Toyota Production System (TPS). This study found that lean application in health care requires administrative engagement and support to be effective. Success with lean will never be instant. Nevertheless, the successful organization will adapt Lean's tools to its context as part of a comprehensive management system that combines not only process improvement but also institutional culture change, innovative leadership, and empowerment of its frontline professionals.

Allway & Corbett (2002) conducted a study about how to implement lean in service industry, using five-phase process in an insurance company which has garnered similarly positive result in industries ranging from banking to health care. This study

found that the application of lean in insurance company can save 10 to 20 percent of operational cost. This study also stated that in these customer-centric, capital-focused times, few approaches can deliver on that objective like the lean approach, and only the lean approach provides service companies with the chance to be the Toyota of their industry. Research findings highlight that, through the adoption of lean service tools, service call centers can serve the traditionally competing priorities both of operational cost reduction and of increased customer service quality. The lean approach is validated in the service context and proposed as a valuable addition to traditional service marketing approaches to services improvement.

A study conducted by Ahlstrom (2004) about the investigation into the contingencies to the applicability of lean production to service companies. A framework for lean production was described and translated into service companies, using an empirical base consisting of descriptions of lean production applications in the service sector, made by practitioners from service companies. The findings indicated that lean production was applicable to service operations, although there were contingencies to the application. The contingencies stem from the characteristics of services. There were also instances where lean production perhaps more applicable to services than manufacturing, again due to the nature of services. The conclusions indicated a need to make operations more general, avoiding making clear differentiation between manufacturing and services, and instead focusing on the similarities between the two and thus the possibility to learn from each other.

The study conducted by Piercy & Rich (2009) has investigated three companies from UK financial service sector on how to analyze the management change of a common process within each company. This study was aimed to examine the application of lean production improvement techniques to the pure-service context and evaluate the contribution of lean production techniques to service marketing improvement.

Sieckmann et al. (2018) through a literature analysis, conducted study describing lean success factor and barriers and proposed a lean production system implementation

process to be taken into account about the unique features of SMEs in the pharmaceutical industry. Special attentions were given to the consideration of human-oriented factors and the appropriate selection of lean methods, which were aligned with business goal. A major obstacle to the implementation of LPS in the pharmaceutical industry was still the limited suitability of individual lean methods and tools for process-related production processes.

Hu et al. (2015) conducted a literature review using Tranfield's method about the implementation of lean within SMEs. This study the lean SME research is characterized by a dominance of single case studies and the use of survey research methods. Most Lean SME researches have been conducted in the Western context with an emphasis on Lean implementation in small manufacturing organizations.

Study conducted by Zhou (2016) that attempted to present an all-inclusive study and examined various factors associated with the implementation of lean in SMEs in the U.S. The sample of the study included a variety of companies in manufacturing, logistics, distribution and retail industries. A hierarchical cluster analysis was conducted to investigate lean status. Found that there exist quite significant differences in terms of the degrees of lean implementation in SMEs. This study also mentioned that there was primary reason why SMEs implement lean, which were: cost reduction, improve profit margin, reduce inventory and assets required, improve utilization of plant/facility, and maintain competitive position. Table 2.1 provides a list of lean practices exercised in SMEs and service industry found in the relevant literature.

Thus, based on the previous research above, this research will implement lean concept into service sector SMEs in this case laundry services. This research will assess the waste and find the causes of the waste to provide suggestion by using lean methodologies and tools to help the SMEs' laundry service in reducing or eliminating their wastes. This research is conducted by recognizing that the application of lean concept for service industry is not yet popular despite of all the benefits that could be obtained by the service industry. All the researches that discuss about the implementation

of lean in service industry concluded that it is possible to be implemented. This research selects SMEs as type of industry due to rare literatures to be found related to this as well as previous researches that hardly have discussed about this type of industry. All of that reasons can be a state of the art for this research that will contribute to knowledge.

Table 2.1 Literature review of lean practices in SMEs

No	Researchers	Object of Research/Title of Study	Method(s)
1	Singh, Garg, & Sharma (2011)	Value Stream Mapping: literature review and implications for Indian industry	Value Stream Mapping (VSM)
2	Mathur, Mittal, and Dangayach (2012)	Improving productivity in Indian SMEs	Single Minute Exchange of Die (SMED)
3	Asnan, Nordin, & Othman (2015)	Managing change on Lean implementation in service sector	Literature Reviews & Lewin's Model
4	Portioli-Staudacher (2010)	Lean implementation in service companies	Survey & Literature Reviews
5	Alsmadi, Almani, & Jerisat (2012)	A comparative analysis of Lean practices and performance in the UK manufacturing and service sector firms	Literature reviews & Survey
6	Zhao, Rasovska, and Rose (2016)	Integrating Lean perspectives and management in services: application to the service department of a CNC manufacturer	Literature Reviews & After Action Review (AAR)
7	Cohen (2018)	Lean methodology in health care	5S, Talk Time, and Literature Reviews
8	Allway & Corbett (2002)	Shifting to lean service: stealing a page from manufacturer's playbooks	Literature Reviews
9	Ahlstrom (2004)	Lean service operations: translating lean production principles to service operations	Literature Reviews
10	Piercy & Rich (2009)	High quality and low cost: the lean service centre	Survey & Literature Reviews
11	Sieckmann, Ngoc, Helm, & Kohl (2018)	Implementation of lean production systems in small and medium sized pharmaceutical enterprises	Literature Reviews
12	Hu, Mason, Williams, & Found (2015)	Lean implementation within SMEs: a literature review	Literature Reviews
13	Zhou (2016)	Lean principles, practices, and impacts: a study on small and medium-sized enterprises (SMEs)	Hierarchical cluster analysis & Literature Reviews

2.2 Theoretical Study

2.2.1 Small and Medium Enterprise (SME)

Small and Medium Enterprise (SME) has different definitions in each literature, agencies, institutions, and even the law. In accordance with Law number 20 of 2008 concerning Micro, Small and Medium Enterprises, SME is defined as follows: (1) Micro enterprise is productive business owned by individual and /or individual business entity fulfilling the criteria of Micro Business as stipulated in law, (2) Small Business is a stand-alone productive economic enterprise, carried out by an individual or business entity which is not a subsidiary or not a branch of a company owned, controlled, or becomes part of either directly or indirectly of the Medium Business or Large Enterprises that meet the criteria of Small Business as referred to in this Law, (3) Medium Enterprises shall be stand-alone productive economic enterprises, carried out by individuals or business entities that are not subsidiaries or branches owned, controlled or be part directly or indirectly with Small Business or Big Business with total sum of net worth or annual sales proceeds as provided for in this Law.

Based on Indonesian Presidential Decree no. 99/1998, Small Enterprise is defined as “Small scale people economical activities with major business category in small business activities and need to protect from unhealthy business competition”. The government of Indonesia defines small enterprises as firm with total asset up to Rp. 200 million excluding land and building, the total annual sales are not more than Rp. 1 billion owned by Indonesian citizens, not subsidiary or branch of medium or large enterprise, personal firm. While medium enterprises are firms with total asset more than Rp. 200 million but not exceed Rp. 10 billion excluding land and buildings. *Biro Pusat Statistik* (Statistic Center Body) defines SMEs based on number of employee. Small enterprise employs 5 to 19 people, medium enterprise employs 20-99 people.

According to Adiningsih (2004) as cited in Hamdani & Wirawan (2012) Government and private sector in Indonesia paid less attention for SMEs in Indonesia before economic crisis 1997. But since Indonesian economic crisis, most SMEs can survive, even increasing in number This condition attract government and private to pay more attention. Furthermore, most SMEs depend on their own capital, employ most workers, and contribute to economic growth (GDP) of Indonesia, make SMEs should have more attention.

The development of SMEs in Indonesia conducted by *Kantor Menteri Negara Koperasi dan Usaha Kecil Menengah* (KUKM) (Ministry of cooperation and small medium enterprise), Ministry of Industry and Trade, Ministry of Finance and Bank of Indonesia. Indonesian government uses business center and cluster to foster SMEs. Business center is activity center at certain location, where there are SMEs that are used similar raw material or facility, produce similar product and have prospect to develop as a cluster (SK Meneg KUKM no.32/Kep/M.KUKM/IV/2002). Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in a particular field that compete but also cooperate (Hamdani & Wirawan, 2012). The purpose of the development is to encourage development of SMEs with technology competence, create conducive business system and climate, create SMEs operational financing assurance system, and provide technical support and managerial mentoring.

According to Tambunan & Supratikno (2004) there are four types of industrial cluster in Indonesia. Dormant cluster is a cluster that dominated by informal sectors. Active cluster is a cluster that able to improve their technology and also their production quality, but they only sold their product domestically. Dynamic cluster is a cluster that able to improve their technology and their production quality. They also start to build networks to sell their product in international markets. Modern or advanced cluster, is a cluster that has applied advanced technology to produce their qualified product and able to sell it in either local market or global market. Most of Indonesian's cluster is a dormant cluster (Tambunan & Supratikno, 2004). Thus, the government tries to develop them into

an advanced cluster. There are also some other characteristics of Indonesian's SME business center such as highest competition among industrial center member, low quality, cost and price oriented, low bargaining power to local middleman, market, low technology, low networking, low need for achievement and development.

SMEs have unique characteristics if compare with large company. These unique characteristics build several SMEs condition that must be considered carefully when developing them. Characteristic of small medium enterprises (Chesbrough, 2010):

- a. Size. Their smaller size makes smaller markets attractive to SMEs while these markets would not be attractive for larger firms.
- b. Focus. Their focus lets them execute very effectively against larger, diversified firms with more diffuse objectives.
- c. Business specialization. SMEs can specialize their business more deeply in narrow fields.
- d. Entrepreneurial persons. SMEs attract more entrepreneurial R&D employees.
- e. Speed. Smaller firms take decisions faster and implement them more rapidly.

2.2.2 Lean Concept

Generally, lean approach is a systematic approach that aims to identify and eliminate process elements that do not add value to the final result of the process (Andersson et al., 2006). Lean can be seen as a concept addressing the quality, cost and delivery of a company's business processes by using an integrated set of principles, methods and tools. Furthermore, Lean is a philosophy of leadership, teamwork and problem solving, resulting in a process of continuous improvement throughout the entire organization by focusing on the needs of the customer, empowering employees. Thus Lean centers the process that delivers and is less about its final outcome, the actual product or delivery respectively.

In addition, lean can be assumed as a commitment that can significantly affect the company's competitiveness. As a strategic approach it can be used to solve severe organizational problems and bring together several ongoing change initiatives in business (Atkinson, 2010). Lean is well-managed as a strategic cost initiative that focuses on key cost efficiencies from the top of the organization or develops in smaller, smaller discrete and iterative initiatives within the organization. The preferred route from the 'top down' approach will have a big positive impact. If managed effectively, Lean can be the main philosophy that unites the organization in an ongoing improvement effort (Atkinson, 2010).

Lean cannot be seen simply as a cost-reduction exercise or as a toolbox that offers a specific tool for any problematic situation, where managers can choose one and everything turns out to be fine. Some people interpret lean as opposed to 'fat' by assuming that Lean's primary target is to lay off people. But Lean is not about cutting staff and resources in the first place, it is about focusing people's efforts on creative tasks, by accelerating operations through the progressive elimination of waste and idle time created by documents and bureaucracy. Easier, functional and useful workplace aspirations should be the main form of motivation for accomplishing lean goals (Bonaccorsi et al., 2011). The difference in Lean's operational system comes from how it changes the way companies learn through change in problem solving, coordination, and standardization (Hanna, 2007). Many people still picture Lean as being an attempt to withdraw unnecessary cost out of an organization. Although Lean can achieve this, if this is the only objective, then Lean will never take its rightful role as a preventative methodology.

2.2.3 Lean Principles in Service

The principles of lean which has been discussed by Womack & Jones (1996) can be applied not only in manufacturing but also be used in service context. The 5 principles are (Damrath, 2012):

- a. Value: can be considered as in the manufacturing environment thinking about the value delivered to or which problem the service can solve for the end-customer.
- b. Value Stream: in analogy to manufacturing for services the value chain or value system need to be optimized.
- c. Flow: making the value flow is not that obvious in service organizations due to the invisibility of service operations and the lack of physical goods.
- d. Pull: in a service environment pull means short-term response to the rate of demand meaning share the final customer demand all along the value chain.
- e. Perfection – striving to perfection through continuous improvements can easily be transferred to service organizations with a focus on delivering exactly what the customer wants exactly when he wants it.

2.2.4 Waste

Lewis (2000) stated that lean is a reduced level of input resources in the system for a striving to perfection through continuous improvements can easily be transferred to service organizations with a focus on delivering exactly what the customer wants exactly when he wants it given level of output. This is achieved by removing waste from the system. This is primarily waste in the form of resources (raw material, WIP, etc.) that are transformed in manufacturing but also includes transforming resources such as people, process technology, facilities etc.

Elimination of waste is the main goal of lean. Womack & Jones (2003) provided a clear definition of waste as “any human activity which absorbs resources but create no value”. Accordingly, there are seven groups of activities were identified by Womack & Jones (2003) as waste (muda):

- a. Overproduction
- b. Waiting (for the next process step)
- c. Transport (unnecessary movement of materials)

- d. Over Processing (rework and reprocessing)
- e. Inventory (excess inventory not directly required for current orders)
- f. Movements (unnecessary movements by employees during course of their work)
- g. Defects

Waste is categorized in two types concerning their avoidance possibility. The first type encompasses the activities which produce no value however it is impossible to eliminate them by means of current available technologies and production resources. The second type includes activities which create no value and can be eliminated from the system right away (Womack & Jones, 2003).

Identification of waste in service may be complex considering that the operations are intangible. In addition, new wastes can be formulated, apart from the traditional ones. Thus, one of the major challenges in service organizations is developing the ability to recognize waste, through the analysis of the customer experience (Andrés-López et al., 2015). Andrés-López et al. (2015) has identified 8 types of waste in service sector which are:

1. Overproduction: Completion of more work than needed or prior to its being demanded by customer.
2. Delay: Delays in terms of employees or customers waiting for information or service delivery.
3. Unneeded Transport or Movement: Needless, non-adding-value movement of resources (people or items), physical (from office to office) or virtual (methods, approaches, paths or tools for performing the same work).
4. Over-Quality, Duplication: Activities or processes that do not add value as perceived by customers. They do not answer to a real need, adding more value to the service than the one customers are willing to pay for. Design or build a work that presents oversized performance if compared with real demand.

5. Excessive Variation, Lack of Standardization: Lack of standardization in the offer or processes, procedures, formats, including expired or outdated with no standard time defined.
6. Failure Demand, Lack of Customer's Focus: Any aspect of a service that fails to conform to customer's expectations or needs, which results in miscommunication and/or opportunity lost.
7. Underutilized resources: Waste of resources, especially human potential, not leveraging employee's talent and potential, under-using their skills, creative abilities and knowledge.
8. Manager's Resistance to Change: "Saying no" attitude from the management, not encouraging all employees to get involved in the continuous improvement process.

In their research Andrés-López et al. (2015) collected a summary of some lean methodologies, including the main type of wastes which were removed or reduced through them, and their applicability related to the type of service. It can be observed that all wastes that mentioned were involved. In addition, regarding to the type of service applicability, it must be highlighted that this classification must be understood as a general rule. Therefore, exemptions can be found.

METHODOLOGY	REDUCED/REMOVED WASTES								CUSTOMER INTERACTION / REPETITIVENESS			
	1	2	3	4	5	6	7	8	LOW/ LOW	LOW/HIGH	HIGH/ LOW	HIGH/HIGH
SVSM	✓	✓	✓	✓					✓	✓	✓	✓
5S		✓	✓	✓	✓	✓			✓	✓	✓	✓
Standardization		✓	✓	✓	✓				✓	✓	✓	✓
Visual Management		✓	✓		✓				✓	✓	✓	✓
Jidoka & Error Proofing		✓		✓						✓		✓
Heijunka	✓	✓		✓	✓					✓		✓
Pull System & Kanban	✓	✓		✓	✓							✓
KPI						✓		✓	✓		✓	✓
Organizational Restructuring						✓	✓	✓	✓	✓	✓	✓
Dojo & Quality Circles						✓	✓	✓	✓	✓	✓	✓
Knowledge Share						✓	✓	✓	✓	✓	✓	✓
Suggestion System						✓	✓	✓	✓	✓	✓	✓
IT in Customer Integration						✓					✓	✓
Hoshin Kanri						✓	✓	✓	✓	✓	✓	✓
Kaizen & PDCA						✓	✓	✓	✓	✓	✓	✓
Six Sigma & DMAIC					✓	✓				✓		✓

Figure 2.1 Lean service methodologies, Reduced waste and service type applicability
Source: Andrés-López et al. (2015)

Figure 2.1 shows methodologies that can be selected into implementing lean in service sector SME. The application of these lean methodologies can be vary and can be adjusted with the capability, problems, and resources of the SME that selected.

2.2.5 Lean Methodologies

The following section briefly describes some of the lean methodologies (new or reassessed) that applicable to the service activities (Andrés-López et al., 2015).

A. Service Value Stream Management (SVSM)

Service Value Stream Mapping (SVSM) is a new and comprehensive lean approach proposed by Bonaccorsi, Carmignani, & Zammori (2011) to spot the criticalities of a service and enhance its performance. SVSM goes far beyond the potentially of the standard VSM that has been specifically modified to tailor the needs of pure services. The Service Value Stream Management (SVSM) enables to spot the criticalities of a service and enhance its performance. SVSM has been specifically modified to tailor the needs of pure services, where the lack of process visibility and ownership make the concepts of value stream and waste elimination less tangible. SVSM follows a step by step procedure made of six points: 1) commit to lean; 2) learn about lean; 3) choose the value stream to be improved; 4) map the current state; 5) identify the impact of waste and set the target for the improvement; 6) map the future state (Bonaccorsi et al., 2011). Figure 2.2 shows the icons that essential in creating map for SVSM.



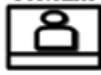










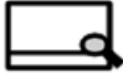










Material Supplier 	Data Supplier 	End Customer 	Service Issue 	Customer Presence 	Priority Queue 
Documents 	Electronic Data 	Push flow 	Pull flow 	Load Levelling 	Time Table 
Kanban 	Process Box 	U-Shaped Cell 	Worker/Employee 	Buffer 	IT Station 
Super Market 	Items Inventory 	Pool Resource 	FIFO Lane 	Queue 	Web Page 

Figure 2.2 SVSM Icons
Source: Bonaccorsi et al. (2011)

B. 5S

The 5S concept (5S) has its origins in a Japanese acronym for seiri (organization), seiton (neatness), seiso (cleaning), seiketsu (standardization) and shitsuke (discipline), a philosophy that is embedded in Japanese everyday life. According to Hirano (1995), Five S's (5S) is Japanese acronyms of seiri (organization), seiton (neatness), seiso (cleaning), seiketsu (standardization) and shitsuke (discipline) as show in Figure 2.3.

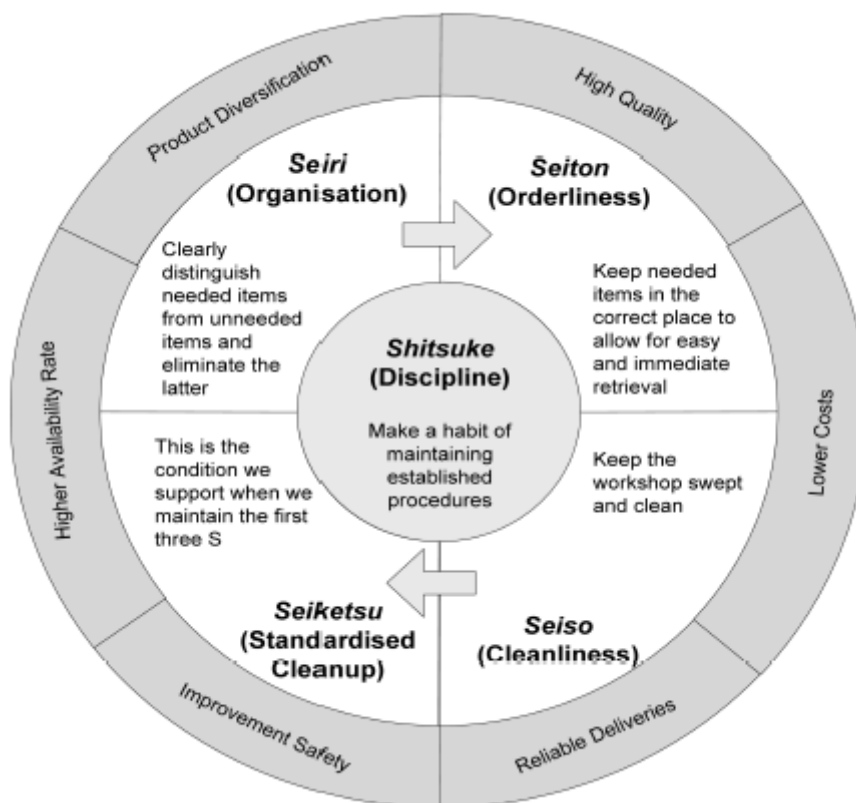


Figure 2.3 Hirano's view of the 5S concept
Source: Hirano (1995).

1. Seiri (organization) does not simply mean lining things up in rows or into neat stacks. According to Hirano (1995) seiri (organization) means clearly distinguishing between what is needed and to kept and what is unneeded and to be discarded. When done properly, seiri or organization is expansive enough to include the organization of job assignment, outside orders, and so on.
2. Seiton (neatness/orderliness) means organizing the way needed things are kept so that anyone can find and use them easily. Orderliness always accompanies Organization. Once everything is organized, only what is necessary remains.
3. Seiso (cleaning/cleanliness) means sweeping floors and keeping things in order. The basics are simply sweeping floors and wiping off machinery or tools. Cleanliness should be integrated into daily maintenance tasks to combine cleaning checkpoints with maintenance checkpoints.

4. Seiketsu (standardization) means that seiri, seiton, and seiso are being maintained. While relating to each of the first three pillars, standardized relates most strongly with cleanliness. It results when we keep machines and their surroundings free of debris and dirt. It is the condition that exists after we have practiced cleanliness for some time. We can also improve the state of “standardized” by devising ways to prevent dirt and grime from accumulating in the first place. This can create a workplace with an even stronger 5S foundation.
5. Shitsuke (discipline) means always following specified (and standardized) procedures. Discipline refers to social and safety conventions, such as friendly greetings among coworkers and wearing the safety gear that already decided. All of these contribute to safety, clean work environment, and a positive work attitude. The first four S’s can be implemented thoroughly without difficulty if the workplace is one where the employees maintain Discipline. It also required to be noted that the key maintaining Discipline is not in a particular tool, such as a 5S checklist. Discipline is best taught by example.

The main goal of the 5S is the prevention of the means, activities and wastages as well which are inconsistent or inexpedient in the work environment (Pranckevicius et al., 2008). With 5S, it becomes possible to remove the unnecessary activities and materials, to perform uninterrupted work flow, to reduce costs and delays, to increase quality of the product and to provide a safe work environment and change employees’ behavior and contribute to productivity, quality and safety (Gapp et al., 2008). Bicheno (2004) agreed that 5S is simple and helpful tool to create Lean culture within an organization.

To improve quality perceived by the customers, 5S methodology in service activities must emphasize its implementation in areas with contact with customers. For a successful 5S application in a service organization a cross-functional team

of operators should consider both general housekeeping (all office activities) and Information Technology (IT).

C. Standardization

It consists of defining the best methods and sequences to optimize efficiency and minimize waste by reducing variation.

D. Visual Management

Considering that service processes are not physically observable, visual management is essential for developing work standards and creating a visual environment, useful as a guidance for process activities. Out-of-standard conditions are thus highlighted by a number of visual techniques, such as charts posted at the workplace or attached colored sheets to bring attention to their presence. Clear visual standards allow to distinguish normal from abnormal situations.

E. Jidoka & Error Proofing

Jidoka is one of the core principles of the Toyota Production System. It means applying the “human touch” to immediately address manufacturing problems at the moment they are detected. Jidoka’s application to service environments should entail alert systems which detect failures in service and stop its supply whenever this occurs. Like many aspects of the Toyota Production System, Jidoka is a simple common-sense methodology, with many powerful benefits (Salinas-coronado et al., 2014):

- 1) Increases trust—Powerfully conveys the Toyota principle of “Respect for People” that empowers and encourages people to report defects and problems without fear of blame.
- 2) Improves communication—Provides clear notification of a problem to customers (downstream workers) and suppliers (upstream workers).
- 3) Creates urgency—Signals an immediate and pressing need to solve the problem.
- 4) Contains the problem—Limits the number of defects produced.

- 5) Involves others—Calls on the supervisor, customers and suppliers (downstream and upstream workers) to help solve the problem.
- 6) Drives prevention—Requires the identification of the root cause to keep the problem from recurring.
- 7) Changes the culture from “blame” to “blameless.”

The term Poka-Yoke was applied by Shigeo Shingo in the 1960s to industrial processes designed to prevent human errors. Shingo redesigned a process in which factory workers, while assembling a small switch, would often forget to insert the required spring under one of the switch buttons. Shingo distinguished between the concepts of inevitable human mistakes and defects in the production. Defects occur when the mistakes are allowed to reach the customer. The aim of Poka-Yoke is to design the process so that mistakes can be detected and corrected immediately, eliminating defects at the source. (Shingo, 1986). Poka Yoke can be used wherever something can go wrong or an error can be made. It is a technique, a tool that can be applied to any type of process be it in manufacturing or the service industry (Salinas-coronado et al., 2014). Poka-Yoke have a low degree of application due to intangible nature of service activities, but they can be understood as part of the Jidoka concept mentioned above.

F. Heijunka

Heijunka’s transferability to service activities can be carried out by taking into account that services also can be grouped into service families, distinguished by similar complexity and similar process steps. Thus, the concept of service talk time, defined as the period of time to complete one service execution to meet average demand, should be adapted to the individual nature of each family.

G. Pull System & Kanban

Pull system application to service activities consists of adapting service to customer demand. This could be achieved allowing the customer to pull the service through service request, service catalogue and the lifecycle of the service provision.

Kanban is a Japanese method of process control based only on actual consumption of materials. Kanban can reduce inventories in the production hall, which are required for optimized production activities. The aim of the system is to control and reduce the cost of storage of materials, increasing the availability of materials and eliminating production downtime due to lack of required materials. One of the most important parts in Kanban is the visual aids, which are used to show when a specific part is needed. These visual aids are usually named “Kanban Cards”. That future the part’s name, picture, code, and the quantity needed. Kanban cards are often attached to a container where they become visible as soon as the quantity reaches a point where more should be ordered. (Salinas-coronado et al., 2014). Kanban methods can be redefined within the IT environment, as a system to monitor the processes.

H. Key Performance Indicator (KPI)

The development of KPIs is possible through the analysis of data gathered during SVSM. They can be divided in operational (to quantify the characteristics of the service activity processes), customer (to evidence the impact of operational performance on the customer) and commercial KPIs (to show the impact of service activity performance on the business). Improvements in operational indicators should result in better service to the customer. Subsequently, improvements in customer indicators should improve commercial performance. The first two indicators can be useful for the top management to link operational improvements and customer and commercial imperatives.

I. Organizational Restructuring

The organizational restructuring involves the management commitment and effective communication of management strategies. The target is to encourage all employees in the improvement processes and the suggestion system.

J. Dojo & Quality Circles

The Dojo is a place and method for structured knowledge sharing by employees through other employees, with the mind set of ‘what our best resources know, can benefit the rest’. This concept increases the overall learning curve of the

organization dramatically and helps to create more multi-skilled employees, capable and ready to perform a variety of tasks throughout the day. While Quality circles encourage employees to improve service activities through their own proposals. By using proven techniques for analyzing and solving work-related problems that are preventing them from achieving and sustaining excellence, the groups work toward mutually uplifting employees, as well as the organization. It is “a way of capturing the creative and innovative power that lies within the work force” (Kiran, 2017). Quality circles are formed of employees working together in an operation who meet at intervals to discuss problems of quality and to devise solutions for improvements, and are led by a supervisor or a senior worker. Quality circle have certain practical advantages they are simple in concept. The attendant set-up costs are fairly modest and they represent an uncomplicated means of involving employees, at all organizational levels, in the pursuit of quality. For these reasons they may be particularly attractive and helpful to SMEs.

K. Knowledge Share

Some knowledge share tools are: creation of knowledge databases (CRM or PLM); demonstrations and simulations; checklists, matrix and flowcharts to guide in decision-making and data finding; sharing team events (team sessions, internal conferences, sessions with senior experts).

L. Suggestion System

The suggestion system encourages employee development, increasing problem awareness and problem solving abilities. Suggestion system results in a permanent questioning of current practices and enables the service organization’s staff to bring suggestions for continuous improvement. This is an essential tool for the development of employee ability to visualize new ways to perform their jobs, consistent with the overall objectives of the company.

M. Use of IT for Customer Integration

Information Technology (IT) platforms can be used to integrate the customer in the service process, involving him in service production. Rearranging services in

a virtual environment can encourage the customers to express their needs and to provide quality feedback from this system.

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This management method enables to align company goals (Strategy) with middle management planning (Tactics) and staff work (Operations), to ensure every member of the organization pulls in the same direction, eliminating the waste of inconsistent direction and poor communication. It must be focused on achieving strategic goals while meeting operational requirements on a daily basis.

O. Kaizen & PDCA

Kaizen is a standard lean methodology for team-based improvement of processes, which includes structured methods to look for improvements, define suggestions, eliminate waste, triggering and implement chosen ideas, receive feedback and measure their effects. Kaizen tools applied to service activities must not be mainly focused on internal processes, but on customer focused perspective by including the customer in Kaizen system's view. This involves close customer contact, prioritizing the satisfaction end customer. PDCA (Plan, Do, Check, Act) is an approach conceived by Shewhart to disciplined problem solving, identifying the root cause.

P. Six Sigma & DMAIC

Six Sigma is applied to describe and measure performance of any type of process. Applied to service activities, Six Sigma must be supported on deep understanding of customer satisfaction, meticulous use of data, and statistical analysis. It enables attention to managing, continuous improvement, and reengineering business processes. DMAIC (define, measure, analyze, improve, control) process consists of a guide for the problem-solving and the selection of improvement tools.

2.2.6 Benefits of Lean Implementation

The main improvements with Lean were related to the reduction of lead times for customers, less usage of inventory, more efficient use of processes, knowledge management improvement, cost savings and reduction in rework (Melton, 2005). Other benefits from Lean are achieving competitive advantage, improving financial position, improving services, increasing quality and process standardization (Sohal & Egglestone, 1994). Melton (2005) discussed the case of process industries, where the problems were the lack of flow in process with full of WIP and functional behavior with no person responsible for delivery orders in supply chain. With Lean implementation, there were many improvements, such as decrease of cycle time in supply chain by 50%, improved customer order accuracy by 25% and inventory reduction from manufacturers by 30%. Furthermore, the implementation of Lean reduced functional barriers. In a study of manufacturing companies in Australia, Sohal & Egglestone (1994) discuss that 74% of them experienced structural changes by flattening their structure due to the implementation of Lean. Moreover, other changes that brought benefits were reducing the workforce, hiring multi tasks employees, as well as employee empowerment, which increased their autonomy.

Some positive factors are the increased employees' competence, faster work completion, reduced frustration with improved customer satisfaction and financial benefits to the organization (Petersson et al., 2012). Hanna (2007) as cited from Rexhepi & Shrestha (2011) also discusses that Lean helps organizations to change their way of problem solving capabilities and standardization. Moreover, it encourages empowerment of employees, and enables organizations to achieve competitive advantage with high quality, faster delivery time and delivery reliability (Petersson et al., 2012). Financial services also benefited from Lean implementation. Atkinson (2004) as cited from Rexhepi & Shrestha (2011) gives an example of financial services that benefited from Lean. Their goal was to simplify the credit approval process in order to improve customers' service. The problem was the complex process that included many steps. The time to complete the process was reduced by 60% by eliminating fourteen steps. Frost

(2007) as cited from Rexhepi & Shrestha (2011) discussed about a bank that simplified the forms for loan approval by three days, which improved quality and added value to customers. In similar context, in one project a bank benefited from Lean by reducing the walking of employee by 2.2 miles.

2.2.7 Implementation of Lean in SMEs

As Womack et al. (1990) concluded lean production is applicable in all industries across the world. Richard et al. (1999) supported this and stated that improvement practices such as lean and JIT are beneficial for both small and large companies regardless of the size factor. Karlsson & Åhlström (1996) concluded that most of the lean practices can be implemented by SMEs, even though they are developed based on large companies. Richard et al. (1999) came to the same conclusion in their research and even realized that practices such as creating multifunctional teams, quality circles, total productive maintenance are easier to implement in SMEs. However, they also realized that practices like JIT purchasing is more difficult for SMES to implement comparing to large companies. In addition, their contextual factor and substantially size of the company affect the implementation of lean production (Shah & Ward, 2003). SMEs, as a consequence of their small size, have some barriers which made them slightly different in comparison with large enterprises concerning effective implementation of lean.

2.2.8 Barriers with SMEs

One of the main obstacles for SMEs is lack of top management support and knowledge (Salaheldin, 2005; Achanga et al., 2006). Management and employees' resistance to change and improvement practices also hinders lean implementation in SMEs (Salaheldin, 2005). According to Achanga et al. (2006), being small causes, some constrains such as lack of financial resources and shortages in management for SMEs in their path of becoming lean. This financial deficiency influence training and prevent

SMEs from having proper training for their employees (Mirzaei, 2011). Lack of skilled resources for implementing lean practices is another obstacle for small companies (Abdul-Nour, et al. 1998; Salaheldin, 2005). Chong (2007) also concluded that lack of finance and time is one of SMEs characteristics. Instability in production schedule also makes it hard for SMEs to carry out improvement practices (Mirzaei, 2011).