

# WHAT DOES DEVELOPING LEAN CAPACITY MEAN?

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## ABSTRACT

*There has been an increase in lean implementation in the construction industry during last few decades, but the progress has been hampered by several barriers. This is due to evidence that suggest the misconceptions regarding lean and its applicability to the construction industry. It appears that either the industry does not recognize lean as a capacity enhancing measure to contribute to bottom line success, and /or there is an inability to overcome the barriers that prevent the uptake of lean. Although, construction literature related to lean implementation barriers and solutions are available in the worldwide, there is a lack of research in capacities that excel lean. Hence, there are two major issues that need to be addressed. Firstly, an insightful discourse on what is meant by lean (as a means of capacity enhancing) is required. Secondly, type of capacities needed to overcome some of the barriers already identified in literature, is necessary. In developing this paper, the strong inter-connectedness of both issues is recognized. In this regard, this paper will discuss the contextual aspects in relation to developing lean capacities necessary to overcome the barriers and to successful lean implementation in the construction industry. A literature review was carried out to discuss the unique characteristics of lean construction and reasons for lean implementation failure to identify the context of lean capacity. The findings revealed that, lack of capacities as the prevalent issue for construction companies to enable lean and these capacities need to be evidently defined for the successful lean implementation. Having considered the construction literature, lean capacity can be defined as the hard/soft resources of an organization which enable maximizing value and minimizing waste of a competitive organization. Lean capacities can divide into 2 categories as soft resources (attitude, capability, knowledge, experience, skill to direct or lead the change and improvements, strategic leadership, program and processes management and networking creation) and hard resources (dedicated employees' time, allocation of fund, means of communication, information, material, financial resources, machineries, technologies/ methodologies, facilities and infrastructure) of an organization. These capacities will allow lean implemented construction organisations to be retained and exceled in lean. Hence, construction organizations need to establish lean capacities to maximize the lean performance and thereby increase competitiveness.*

**Keywords:** Capacity; Lean Capacity; Lean Construction; Resources.

## 1. INTRODUCTION

Construction industry in many parts of the world suffers from problems such as workmanship defects, time, and cost overrun to name few (Harrington, Voehl & Wiggin, 2012). As globalization proceeds, developing countries and their enterprises face major challenges in strengthening their human and institutional capacities to take advantage of trade and investment opportunities (OECD, 2004). Lean has various inherent direct advantages that enhance the organizations ability to successfully compete through being more effective and efficient in their operations (Hu, Mason, Williams & Found, 2015). In addition to these more obvious benefits, there are some notable indirect advantages that arise from successful lean implementation (Hu et al., 2015).

Thus, this paper begins with an introduction to lean implementation in the construction industry. The next section present lean construction concept to elaborate the benefits and barriers of lean implementation for construction organizations. Misconceptions about lean and its applicability to the construction industry will discuss in detail to analyse the barriers for lean implementation. Section 3 discusses capacities to overcome the barriers in lean implementation followed with a special emphasis to define lean as a means of capacity enhancing in the next section. Finally, importance of lean capacity present together with a contextual model to enable lean in the construction industry.

## **2. LEAN IMPLEMENTATION AND ADOPTION IN THE CONSTRUCTION INDUSTRY**

Lean strategy brings a set of proven tools and techniques to reduce lead times, inventories, set up time, equipment downtime, scrap, rework and other wastes of the hidden factory (Kumar, Antony, Singh, Tiwari & Perry, 2006). Principles of lean thinking have been broadly accepted by many production/operation managers and applied successfully across many disciplines (Bhamu & Sangwan, 2014). One main tenet of lean thinking is that everything can be further improved (Andersen, Belay & Seim, 2012). There is an increasingly positive trend in the construction industry to implement lean and seek the required improvement targets (Nesensohn, Bryde, Ochieng, Fearon & Hackett, 2014). Having the characteristics of both production and service systems, the construction industry also taken some steps toward applying the lean production concept (Howell, 1999). Moreover, lean construction seeks to adopt lean production methods into construction (CRC for Construction Innovation, 2007).

Koskela, Howell, Ballard and Tommelein (2014) introduced two slightly differing interpretations of lean construction. One interpretation about the application of lean production concepts to construction and the other interpretation views lean production as a theoretical inspiration for the formulation of a new, theory-based method for construction, called lean construction (Koskela *et al.*, 2014). However, Aziz and Hafez (2013) specified that lean construction is using the same principles as lean production to reduce waste and increase the productivity and effectiveness in construction work. Lean construction is a way forward to design production systems to minimise waste of materials, time and effort which leads to possible generation of maximum amount of value (Marhani, Jaapar & Bari, 2012). Organizations have been adopting lean concept which is a process improvement and problem solving approach for achieving higher degree of quality (Prasanna & Vinodh, 2013).

### **2.1. BARRIERS FOR LEAN IMPLEMENTATION**

Mossman (2009) specified that number of circumstances influence against successful lean implementation and none of them on their own are able to evade. Accordingly, there seems to be some barriers to the successful implementation of lean construction (Ogunbiyi, Oladapo & Goulding, 2013). A survey conducted by the practitioners of lean implementation revealed that changes to the production environment due to lean have only a 30% success rate and 70% of lean implementations experience decay and return to the original way of doing business (Schipper & Swets, 2010). Moreover, only 32% of the surveyed companies in Abu-Dhabi were found to be familiar with and using lean techniques and the majority emphasized the need for a practical framework for adopting lean techniques (Aomar, 2012). This indicates that lean implementation is not free from barriers (Jadhav, Mantha & Rane, 2014).

Shang and Pheng (2014) identified people and partner, managerial and organizational hurdles, lack of support and commitment, cultural and philosophical issues, government related issues and procurement related issues as barriers for lean practices in the Chinese construction industry. Further, Shang and Pheng (2014) specified that the lack of a long-term philosophy and the absence of lean culture in their organizations are the most crucial obstacles to lean practice in the construction industry. The factors that hinder companies from implementing lean are ineffective inventory management, lack of supplier participation, lack of quality improvements and quality control and lack of employee participation and top management commitment (Rahman, Sharif & Esa, 2013). Key reported obstacles of adopting lean techniques in Abu-Dhabi specified by Aomar (2012) include the financial crisis in the economy. Hence, construction managers consider lean initiative as an added cost and hence no lean initiation can grasp in construction projects. Therefore, lack of top/senior management involvement (commitment and support) identified as another barrier. However, many authors (Rahman *et al.*, 2013; Jadhav *et al.*, 2014; Shang and Pheng, 2014; Green, Harty, Elmualim, Larsen & Kao; 2008; Aomar, 2012; Smart Market Report, 2013) agreed to workers' resistance to change as the major barrier for lean implementation. According to the authors, workers oppose to change from their regular routine of work and adapt to new technology. Moreover, workers are not easy to educate and refuse to change due to lack of capacities. Therefore, these barriers hinder construction firms adopting lean construction.

### **2.2. MISCONCEPTIONS ABOUT LEAN AND ITS APPLICABILITY TO THE CONSTRUCTION INDUSTRY**

Lean has both positive views (Howell & Ballard, 1999; Hines, Holweg & Rich, 2004; Bhamu & Sangwan, 2014) as well as contradicting views (Green, 1999). Green (1999) specified that most of the literature take it

for granted that lean production is a 'good thing' and offer a coherent and seemingly persuasive argument in favour of transporting the principles of lean production into the construction industry in dark side of lean construction. Howell and Ballard (1999) answered by stating that Green misses the key foundations of lean which came from a long history of production management thinking and first attempts to manage the physics of production in the service of higher performance. Moreover, an important gap in the literature concerned with the lack of understanding of the relationships between the risks in lean implementation (Marodin & Saurin, 2015). According to Jadhav *et al.* (2014), lean implementation issues may vary from country to country, work culture of the organization and geographic location within the country. Rework, uncertainty, labour skills, site conditions and location are some examples of such factors that need further analyses for leaner construction processes (Al-Sudairi, 2007). Even though, construction industry appears to be one of the pioneering industries to absorb lean concepts and techniques (Shang & Pheng, 2014), lean do not receive the attention they deserve in the construction industry. The significance of lean implementation barriers according to lean practitioners and non-lean practitioners showed in Figure 1 as per the findings of McGraw hill construction in Smart Market report-2013.

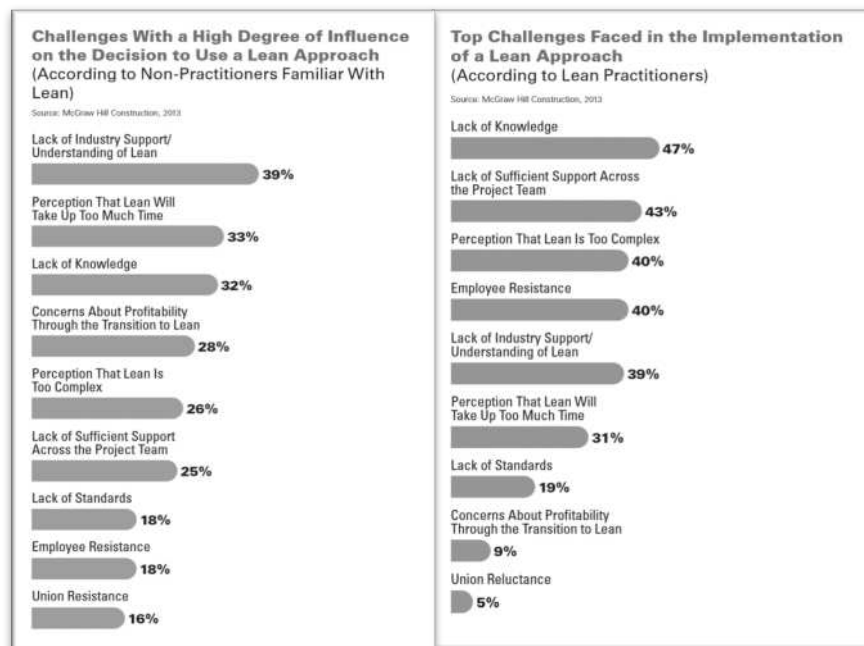


Figure 1: Significance of Lean Implementation Barriers According to Lean Practitioners and Non-Lean Practitioners  
(Source: Smart Market report, 2013)

According to above Figure, lack of sufficient knowledge identified as the biggest barrier by lean practitioners. According to non-lean practitioners, the highest percentage (39%) found that lack of industry support and understanding of lean is a highly important challenge and 32% found that lack of knowledge is problematic. These findings demonstrated that the need of more information and education on lean to the industry. Those who have not implemented lean do not fully understand the challenges posed by working with project team members who are not engaged in lean. This also reinforces the call for necessary capacities to enable lean, so that firms understand the full benefit and major obstacles they face in implementing and retaining lean practices and can make informed decisions. It is necessary that companies rethink their business strategies and implement focused strategies (Guzman, Gutierrez, Cortes & Ramire, 2012) to overcome these barriers for construction industry to reap the benefits of lean construction implementation (Ogunbiyi *et al.*, 2013). Similar to other researchers, Rymaszewska (2014) contended that organizations benefited from converting to lean, provided the process is adjusted by analysing the existing and required capacities.

### 3. CAPACITIES TO OVERCOME THE BARRIERS IN LEAN IMPLEMENTATION

Hines *et al.* (2004) specified that lean exists at two levels, the strategic and operational levels. The strategic level has the customer-centered thinking and involves everyone at the company, where the operational level does not. This has created a misunderstanding for the use of lean and many companies have their major focus on lean implementation on the shop floor level, without considering lean thinking. In order to implement the right tools and strategies to create customer value, it is crucial to understand lean and organizational capacities (Linné & Ekhall, 2012). Hence, the transformation towards lean construction will lead to changes in the culture and in its people (Green *et al.*, 2008) where identification of existing capacities and required capacities are paramount for successful lean implementation.

Merino and Carmenado (2012) defined capacity as the existence of resources, networks, leadership and group process skills and capacity building is a cyclical concept related to the development of human, organizational, institutional and social capital. Capacity enforced with development projects through capacity building to have a more robust structure and to adaptive to changes (UNESCO, 2010). Hence, capacity building understood not only as human resource development but also as organizational and institutional development (UNESCO, 2010). Horton *et al.* (2008) define two categories of capacity that organizations need to develop: resources (staff, infrastructure, technology and financial resources) and management (strategic leadership, program and processes management and networking creation). Each of these categories has operational and adaptive aspects that have to be established and maintained (Horton *et al.*, 2008 cited in Merino & Carmenado, 2012).

Groot and Molen (2000) identified knowledge, skills and attitudes in individuals and groups of people relevant in design, development, management and maintenance of institutional and operational infrastructures and processes that are locally meaningful as some of the capacities of an organization. Similarly, Enemark and Ahene (2002) identified human resources in terms of knowledge, skills, personal and group attitudes for developing and managing certain areas in the community or an organization, which ensure long-term sustainability as organizational capacities.

Lean is not just a set of tools and techniques, but at its heart are the people (Ohno, 1988 cited in Bhasin, 2012). It is the people whose knowledge, intelligence and desire to improve that steers organizations to new levels of continuous improvement (Hines *et al.*, 2008; Bhasin, 2012). Therefore, lean relies heavily on the skills of the people and how they respond to change (Sawhney & Chason, 2005) which is one of the major barrier for lean implementation for construction organizations. Hence, applying lean construction for design and construction within the industry is becoming a highly pertinent issue (Nesensohn *et al.*, 2014). According to Koskela *et al.* (2014), lean-based construction requires changes in individual behaviour as well as the resources of the organization. This has clearly indicated the call for defined capacities for successful lean implementation. Hence, identification of capacities to overcome barriers of lean implementation will add an extra value for construction companies to better perform in the industry. Therefore, construction companies need to identify necessary capacities to obtain the full benefit of lean implementation.

### 4. WHAT IS MEANT BY LEAN AS A MEANS OF CAPACITY ENHANCING?

Lean interpreted in many ways by practitioners and academics that mean there is no real consensus around what lean specifically stands for and exact characteristics associated with the lean concept (Bhamu and Sangwan, 2014). Today many companies committed to lean. Hence, it is important to assess what lean principles these companies believe in and reflect upon how they affect the organization (Linné and Ekhall, 2012). If companies want to implement lean principles in their processes, they need to have a clearly stated lean philosophy. The philosophy is working as the basis for all other lean principles. It is essential to have one clear stated philosophy to benefit from the other lean principles. This philosophy should be shared throughout the entire organization to achieve outstanding results.

The origins of lean thinking found on the shop-floors of Japanese manufacturers and, in particular, innovations at Toyota Motor (Hines *et al.*, 2004). Toyota developed the techniques that support the principles of lean production. However, Howell (1999) specified that this initiated by Taiichi Ohno at Toyota Motor Corporation. Lean is a management philosophy derived mostly from the Toyota Production System (TPS) and identified as lean only in the 1990s (Liker & Morgan, 2006). The term was coined by the research team working on international auto production to reflect both the waste reduction nature of the Toyota production system and to contrast it with craft and mass forms of production (Womack *et al.* 1991). The first applications of lean

recorded in the Michigan plants of Ford in 1913, and then developed to mastery in Japan (within the TPS) (Laureani & Antony, 2012). Hines *et al.* (2004) stated that the techniques of eliminating waste and excess from the product flows were first introduced to automotive engine manufacturing, then to the automobile assembling, and later applied to the entire Toyota supply chain. During 1970s, supplier manuals produced and the secrets of this lean approach shared with companies outside Toyota for the first time (Hines *et al.*, 2004). Many companies throughout the world are seeking to learn from Toyota's system. Typically they limit their exploration to a few superficial lean tools. Hence, organizations that have seen success with lean tools in manufacturing plants want to apply them to their own product development processes (Liker & Morgan, 2006) to maximise value while minimising the waste.

Waste is everything that does not directly contributes to add value to a product, under the perspective of customers' needs and requirements (Alves, Carvalho & Sousa, 2012). Womack and Jones (2003) describe waste (*muda*) as any human activity which absorbs resources, but creates no value. Thus, by eliminating waste, activities can become lean; which provides more with less resources (Womack & Jones, 2003). It includes all inefficiencies in a system as well as causes of these inefficiencies and called as *muda* (Womack & Jones, 1996). This is a fundamental concept of lean manufacturing and one of the most efficient ways of enhancing capacities and improving profitability of a company. However, the starting point of continuous improvement is to identify waste. There are seven types of waste identified under lean as overproduction, overstocking, excessive motion, waiting time, delay and transportation, extra-processing, defect and rework (Ogunbiyi *et al.*, 2013). However, Alves *et al.* (2012) referred to non-utilization of human potential as the eighth waste where Green (1999) critique human stress also needs to add. Researchers found that many development activities treated as waste since they add no value to the final product (Liker & Morgan, 2006; Ward, 2007). The goal of lean philosophy is to design and manufacture products of high quality and low-cost in an efficient way through eliminating all waste (Hopp & Spearman, 2008). Henceforth, an organization needs focusing on eliminate waste to improve existing capacities and hence value addition.

At the heart of lean philosophy, value defined based on the customers' perspectives in terms of cost, product functions (Chen & Taylor, 2009). The importance of customer value is displayed by two levels of lean approach as strategic and operational. The strategic level of lean thinking requires understanding the value of customers where the operational level achieves requirements set by customers through the practice of lean production techniques (Hines *et al.*, 2004). With a focus on enhancing value and reducing waste from a system's perspective, it argued that the lean philosophy and its basic elements address both design and production processes (Jørgensen & Emmitt, 2009).

However, researchers have given different meanings to lean (Alves, Milberg & Walsh, 2012; Alves, Azambuja & Arnous, 2016). Moreover, lean is highly interpretive and there is no shared definition or understanding of what is meant by lean, lean production, and lean construction (Jørgensen & Emmitt 2008). One of the reasons for the lack of a precise and widely accepted definition for what lean system entails is the lack of definition of lean production where it all started (Alves *et al.*, 2012b). Despite the ever-growing literature on the topic, Lillrank (1995) highlights that the Japanese have not been very articulate about the reasons for their success. There was no great master plan up front and no blueprints that could have been studied. Therefore, the Japanese experience was widely open for various explanations and interpretations (Alves *et al.*, 2012b). A closer look upon lean, history revealed fundamental differences between manufacturing and service environment. Arfmann and Barbe (2014) argued that the answers Toyota found for their problems through the development of lean do not provide an answer to many of the challenges faced by service organizations. The principles do not necessary work because service is different in push and pull practice, in the inability of storing capacity, in the creation process and especially in the variety of demand (Arfmann & Barbe, 2014). Koskela (2004) suggested that the principles presented by Womack and Jones (2003) are highly compressed and that they may harmful to the understanding of lean production as a whole, as many elements may missing in the explanation of the five lean thinking principles (Alves *et al.*, 2012b). Womack and Jones (1996) codify that, the essence of lean production into five well-known basic principles as specify value, identify the value stream, avoid interruptions in value flow, let customers pull value, start pursuing perfection again. Koskela (2004) specified that the five principles provide an exhaustive, mature foundation equal to a theory for the transformation of any productive activity. Nevertheless, Howell (1999) specified that, the basic outline of lean production include

- Identify and deliver value to the customer value: eliminate anything that does not add value.
- Organize production as a continuous flow.

- Perfect the product and create reliable flow through stopping the line, pulling inventory, and distributing information and decision-making.
- Pursue perfection: deliver on order a product meeting customer requirements with nothing in inventory.

The key to success of implemented lean principles in processes is rather how people use the principles than the process itself (Liker & Meier, 2006). Many companies believe in lean as an approach to improve processes and thereby gain competitive advantage. However, it is unclear if lean is an approach to mitigate problems in an organization (Linné & Ekhall, 2012). Nevertheless, Laureani and Antony (2012) defined lean as a process improvement methodology used to deliver products and services better, faster, and at a lower cost. Hence, lean will enhance the existing capacities of an organization. In contrast, lean implementation required particular other capacities as well. It should be viewed in a wider context to achieve the overall goals (Enemark, 2003) as it differs from project to project and even organization to organization (Wal & Marks, 2007). However, Womack and Jones (2003) come closest to a definition as lean production is lean because it uses less of everything compared with mass production; half the human effort in the factory, half the manufacturing space, half the investment in tools, half the engineering hours to develop a new product in half the time. According to Howell (1999), lean is about building reliability. Alves *et al.* (2012b) commended that lean production evidenced as a model where the persons assume a role of thinkers and their involvement promotes the continuous improvement and gives companies the ability they need to face the market demands and environment changes. Moreover, it referred to as an integrated manufacturing system for minimising inventory levels and maximising capacity use through the minimisation of variability in the system (Wacker, 2004; de Treville & Antonakis, 2006; Fuentes & Dias, 2012).

Managing organizations under lean is different from typical contemporary practice as it has a clear set of objectives for the delivery process, for maximising performance for the customer at the project level, designs concurrently product and process and applies production control throughout the life of the project (Howell, 1999). Hence, lean enabling organizations are easy to manage and they are highly competitive in the industry. Unfortunately, neither resource nor capacities to enable lean in organizations have been explored. Hence, these resources need to evidently define for the successful lean implementation.

According to Jadhav *et al.* (2014), resources are primarily concerned about the human resources (soft resources) such as attitude, capability, knowledge, experience and skill to direct or lead the change and improvements. Physical (hard) resources include dedicated employees' time, allocation of fund, means of communication, information, material, machineries, technologies/methodologies, facilities and infrastructure (Jadhav *et al.*, 2014). Hence, lean capacity defined as the hard/soft resource of an organization which enable maximising value and minimising waste of a competitive organization. Hence, necessary lean capacities need to identify to optimize the benefits of lean implementation.

## **5. IMPORTANCE OF LEAN CAPACITY**

Continuous improvements are important for companies to stay competitive in a changing environment. This is one of the benefits that companies believe in as a result of implementing lean in their organizations (Linné & Ekhall, 2012). Lean will allow companies to face continuous changes and disturbances, by giving them agility, the ability to quickly react to technical or environmental unpredictable problems or difficulties, to cope with such environments, companies need proactive workforces, and able, ready and motivated to think and suggest improvements (Alves *et al.*, 2012a). Hence, specific capacities need to carefully identify to overcome the barriers of lean implementation and hence, the identification of lean capacities. It is thus interesting to investigate on lean capacities. There exists a gap in current literature of how lean principles applied using company's existing capacities. Moreover, companies want to use their existing capacity as much as possible to get return on their investments (Christopher, 2005). The required lean capacity compared with the available capacity to identify capacity imbalances. Avoiding capacity imbalances are important since production resources available for adding value are associated with costs, regardless if the resources are used or not (Linné & Ekhall, 2012). On one hand, if the available capacity exceeds the requirements, this will lead to overcapacity and thereby low resource utilization. On the other hand, if a manufacturer lacks capacity it cannot meet the demand from customers and thereby experience loss of income. Nevertheless, majority of local construction organizations in developing countries lack capacity and cannot meet the demand of construction work (Enshassi, Al-Hallaq & Mohamed, 2006; Didibhuku & Mvubu, 2008 as cited in Kululanga, 2012). At the same

time, high global competition demands construction organizations a higher level of capacity to maintain or increase steadily the performance of the business (Lagace & Bourgault, 2003). To sustain a fair level of competitiveness in both the domestic and global markets, they must strive to utilize lean capacities to reach the right markets in cost-effective ways (Singh, Garg & Deshmukh, 2010). Hence, identification of lean capacities will guide organizations to minimise the barriers of lean implementation and to optimise performance in the industry. Figure 2 shows a contextual model developed to overview how lean capacities pave the way towards lean enabling construction organizations.

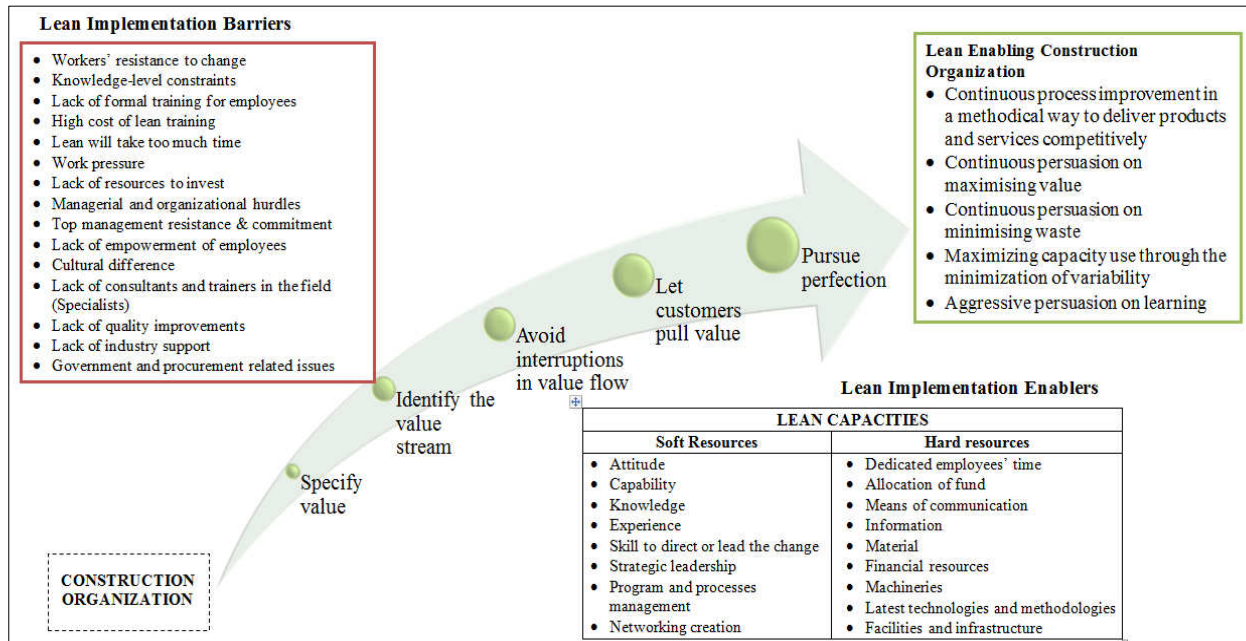


Figure 2: Contextual Model for Lean Enabling Capacities

According to Figure 2, construction organizations can overcome most of the challenges by lean implementation. By implementing five lean principles as shown in the middle arrow, pave the construction organization to lean enabling construction organization. Some of the distinct characteristics of lean enabling construction organization are present in the right top corner square. The lean enabling construction organization rich with characteristics such as continuous process improvement in a methodical way to deliver products and services competitively, continuous persuasion on maximising value and minimising waste, maximising capacity use through the minimisation of variability and aggressive persuasion on learning. These characteristics of lean enabling construction organization shows in the top right corner square of the contextual model. However, a successful lean implementation path is likely to be influenced by several factors which show in the left top corner square. Identified barriers are workers' resistance to change, knowledge-level constraints, lack of formal training for employees, high cost of lean training, lean will take too much time, work pressure, lack of resources to invest, managerial and organizational hurdles, top management resistance & commitment, lack of empowerment of employees, cultural differences, lack of consultants and trainers in the field (specialists), lack of quality improvements and quality control, lack of industry support and understanding of lean and government related issues and procurement related issues. Hence, construction organizations need rethinking of their business strategies and implement focused strategies, adjust process by analysing the existing and required capacities, understand lean and organizational capacities and changes in individual behaviour and the resources of the organization. These strategies will overcome lean implementation barriers and accelerate the process towards lean enabling organization. However, construction organizations lack capacities and are incapable of implementing such strategies. Therefore, it is important to investigate lean capacities which show in the bottom Table of the model. These lean capacities divided in to two categories as soft and hard resources of an organization. Soft resources include attitude, capability, knowledge, experience, skill to direct or lead the change and improvements, strategic leadership, program and processes management and networking creation. Hard resources include dedicated employees' time, allocation of fund, means of communication, information, material, financial resources, machineries, technologies/methodologies, facilities and infrastructure. However, this model identified only the contextual

aspects of lean capacities and these aspects needs further investigation to ascertain the relationship to lean capacities. Further, this model describes a process which lean capacities developed.

## 6. CONCLUSIONS

There has been a notable growth in lean implementation in the construction industry. To integrate lean in a construction organization, it is recommended to understand and anticipate situations (barriers) that might be opposed to a proper implementation, as well as taking hold of those that can help ensure its success based on similar experiences in other contexts (Cano, Delgado, Botero, & Rubiano, 2015). Hence, this paper critically reviewed the current state of construction organization to identify the challenges faced by them and how lean implementation can solve the challenges. Many researchers highlighted the importance of implementing lean concepts and building capacities in the construction industry to obtain the full benefit of lean construction. Hence, it is essential to identify capacities necessary to overcome the barriers of lean implementation in the construction industry and hence, a clear understanding of the meaning of lean capacity. Therefore, this research paper defined what does lean capacity mean for the construction industry. Accordingly, lean capacity defined as the hard/soft resource of an organization which enable maximising value and minimising waste of a competitive organization. Lean capacities can divide in to two categories as soft resources (attitude, capability, knowledge, experience, skill to direct or lead the change and improvements, strategic leadership, program and processes management and networking creation) and hard resources (dedicated employees' time, allocation of fund, means of communication, information, material, financial resources, machineries, technologies/methodologies, facilities and infrastructure) of an organization. Even though most of the lean implementation barriers eliminated by lean capacities, certain barriers are within the control of the organization where one characteristic of lean capacity is the ability to identify the barriers relevant to their organization as these barriers are wary from organization to organization. However, some barriers are beyond the control of an organization which needs further analysis. The contextual model will guide the construction organization to overview the way towards successful lean implementation and describe the process for which lean capacities need to develop. Prior to the lean implementation, knowing this wide-set of barriers, it is advisable to provide a way to prevent their occurrence or mitigate their impact, based on acquaintance of the lean capacities to strengthen the lean implementation in the construction industry. As better lean practices achieved through identification of lean capacities, construction organizations need to focus on how to improve lean capacities in order to be competitive in the construction industry. Even though, lean and capacity related literature is discretely available in the worldwide, there is a lack of research in lean enabling capacities that enable lean in construction organizations. Hence, a proper empirical study required to recognize the lean capacities that excel lean. This paper based on literature review to define lean capacity. The definition will guide further researches. Drivers, benefits and barriers for lean capacities need further researches. Our future research will target to develop a lean capacity model with strategic guidelines to foster construction organizations.

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