



Position Paper

Exploring the Role of Lean Methodology as a Tool for Performance Improvement in Healthcare Projects: An Ethnographic Case Study in U.A.E.

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Abstract

Purpose: The position paper explores the value and role of Lean methodology in healthcare projects. The objective of the research is to review the topic of Lean healthcare with the intention of recognizing its merits and limitations. It replies to the criticism surrounding the application of Lean in hospital projects. Through an ethnographic case study, the research identifies the position of the researchers supporting the continuous application of Lean performance improvement in the context of project management within the healthcare sector.

This study aims to encourage researchers and healthcare leaders to rethink the role of Lean healthcare and work on innovative ways to streamline healthcare projects to address its challenges appropriately.

Design/methodology/approach: This paper is supported by a real example of a public hospital in the UAE that has succeeded in applying Lean and by responses to criticism of opponents of the Lean application in hospital projects based on a literature review of peer-reviewed publications.

Findings: This paper highlights the strong links between highly reliable healthcare provision to patients in hospitals and Lean methodology. In this study, we found through an ethnographic case study that hospitals that invest in Lean brought value to the patients and decreased unproductive work. The findings will highlight several benefits of Lean in healthcare projects. This paper ends with conclusions and recommendations that highlight further research that can rise to the criticism of Lean methodology and enhance and revitalize its use in practice.

Originality/value: This research illustrates the potential link between high reliability healthcare and Lean methodology in hospitals to stimulate further discussion and enable more evidence-based decision making for the researchers and policy makers about adopting Lean as a performance improvement strategy. This research shows the value of an auto-ethnographic view on Lean management learning as a tool for performance improvement in healthcare projects.

Keywords: Lean methodology, Project Management, Healthcare, Projects, Hospitals, UAE
Paper type: Viewpoint supported by case study

I. Introduction

The most important goal of hospitals is to establish highly reliable healthcare provision to their patients. However, high-reliability science is usually associated with industries such as commercial aviation and nuclear power “that operate under hazardous conditions while maintaining safety levels that are far better than those of healthcare” (Chassin & Loeb, 2013). In this paper, we regard high reliability in healthcare as meaning

that “all people always experience the safest, highest-quality, best-value healthcare across all settings” (Joint Commission, 2014).

A major step towards the above goal for hospitals could be the adoption of Lean methodology. Lean is “a process improvement methodology used to deliver products and services better, faster, and at a lower cost” (Laureaniet *al.*, 2013). Womack and Jones (1996), as cited in (Laureaniet *al.*, 2013), defined Lean as:

“[. . .] a way to specify value, line up value-creating actions in the best sequence, conduct those activities without interruption whenever someone requests them, and perform them more and more effectively. In short, Lean thinking is Lean because it provides a way to do more and more with less and less – less human effort, less human equipment, less time, and less space– while coming closer and closer to providing customers with exactly what they want.”

There are many perspectives and perceptions of Lean circulating practically and academically, “depending upon the industry, the source, how long the organization has been learning about Lean and what that organization's real objectives are for adopting Lean” (Anvariet *al.*, 2011). Lean methodology may be called Lean manufacturing, Lean production, Lean thinking, Lean philosophy or Lean management.

Currently, there is also Lean project management (Ballard & Howell, 2003). Abuhejleh *et al.* (2016) stated that “Lean theory, principles and techniques, taken together, provide the foundation for a new form of project management”. In Lean project management, the project management methodology is transformed by using Lean concepts and training participants in Lean strategies, tools and principles. This is accompanied by the applicable process improvement, leadership and project management skills to drive the changes for longer-term sustainability. However, to apply the right strategies and tools, it is important to realize that Lean exists at two levels, strategic and operational; neither of the dimensions is more relevant than the other, but it is necessary to understand Lean as a whole with all of its aspects. In addition, “Lean can be seen as having both a philosophical as well as a practical orientation” (Anvariet *al.*, 2011).

Lean was first successfully adopted in manufacturing by the Japanese car manufacturer Toyota. The core concepts of Lean strategies emphasize waste elimination and process streamlining. Healthcare has lagged behind manufacturing in adopting Lean due to major resistance related to several concerns. Our position is that Lean is a feasible, practical, beneficial and transformational methodology in healthcare in general and in hospital projects specifically. Nevertheless, these merits must be balanced against existing criticism. The opponents of Lean in healthcare, mainly those who are in practice, criticize it from several different aspects. The major areas of criticism that this research has focused on are as follows: Lean is for manufacturing, not for a service industry such as healthcare; it is difficult to accept Lean Japanese jargon; Lean might lead to staff lay-off or outsourcing, and Lean training is high cost. The authors take up position alongside others who support and encourage future projects of Lean implementation in hospitals. The research is supported by a real example of a public hospital in the UAE that has succeeded in applying Lean, and by responses to the criticism of opponents of the application of Lean in hospital projects based on a literature review of peer-reviewed publications.

This paper intends to accomplish the following:

- Explain Lean project management and its tools
- Evaluate the link between Lean and hospital project management
- Scrutinize the areas of concern and discuss local examples
- Suggest steps taken by experts in the field to maximize chances of success

This paper is the first in the UAE calling for the application of Lean in hospitals and is supported by a review of both sides of the argument. The aim of this position paper is to review the topic of Lean healthcare with the intention of recognizing its merits and limitations. The paper will outline the views of the supporters and opponents of Lean methodology in hospitals. Hopefully, it will help to stimulate further discussion and enable more evidence-based decision making about adopting Lean as a performance improvement strategy. With management commitment and employee involvement across all levels, our position is that hospitals can transform healthcare and take a major step in becoming high reliability organizations.

This paper is organized as follows. The following section summarizes a literature review and provides key concepts and tools in Lean healthcare. In section 3, the ethnographic case study is presented, and then the findings highlight the benefits of Lean in healthcare projects. In the last section, the conclusion is provided.

II. Background

Lean methodology or Lean management is most generally linked with Japanese manufacturing, particularly the Toyota Production System (TPS). The Lean approach focused on the waste elimination process from the strategic product streams at Toyota (Toyota derived seven wastes, and Liker (2004) derived eight wastes, as stated in his book *The Toyota Way*). A recent study highlighted the fact that “much of the early work at Toyota was applied under the leadership of Taiichi Ohno to car engine manufacturing during the 1950s, later

to vehicle assembly (1960s), and the wider supply chain (1970s)” (Hines *et al.*, 2004). Until 1990, Lean manufacturing had some weaknesses; for example, its view was exclusively based on the auto industry. The operation was totally tool-focused and commonly ignored the aspects of human related work with high performance, which is a core of the modern Lean approach. After 1990, there was an ongoing broadening of emphasis far from the shop floor. The influential work of Womack *et al.* (1990) described in their book *The Machine that Changed the World* has contributed to the evolution of Lean, especially in manufacturing or production. It led to the understanding that Lean occurs in two dimensions, strategic and operational, and it is vital to realize Lean as a whole, i.e., across both dimensions using the correct strategies and tools to deliver customer value. It is widely recognized that being Lean is valuable. As a result, many industries have modified their production systems to involve a different design built on “Lean principles” (Hines *et al.*, 2004; Bhamu&Sangwan, 2014).

A comprehensive study by Teich and Faddoul (2013) indicated that incorporation of Lean principles involved: “1. Identification of customer value, 2. management of value stream, 3. developing capabilities of flow production, 4. use of pull mechanisms to support flow of materials at constrained operations, and 5. pursuit of perfection through reducing to zero all forms of waste”. Thereafter, the “value stream” grew little by little and was seen to stretch beyond the manufacturing and extend from the needs of customers to the sources of raw materials (Hines and Rich, 1997; Rother and Shook, 1998, cited in Hines *et al.*, 2004).

In this awareness period, a new approach of thinking appeared that viewed projects as production systems with potential to practice ideas of Lean production in project management. Lean project management is explained in the literature by Ballard and Howell (2003), who write: “projects are temporary production systems. When those systems are structured to deliver the product while maximizing value and minimizing waste, they are said to be Lean projects”.

According to AlBalushiet *al.* (2014), Lean has also been defined as “a system which requires less time, less human effort, less cost, less space, with fewer injuries, and less mistakes, to create an organization that accomplishes more and does these better.” Thus, having defined lean and its professional meanings from the literature, it becomes essential to discuss the importance of organizational readiness in terms of successful implementation, particularly those that are relevant to the setting of healthcare. Lean in healthcare is usually named “Lean Healthcare Management System” or merely “Lean health” (AlBalushiet *al.*, 2014) cited (Poksinska, 2010; Waring and Bishop, 2010). Lean has been applied in healthcare settings for over 10 years; see Figure 1. AlBalushiet *al.* (2014, citing Joostenet *al.*, 2009; Waring and Bishop, 2010) agree that “the application of Lean in healthcare is a relatively young field for study when compared to the half-century of Lean practice at Toyota Corporation and the 30 years or so in manufacturing generally around the world”. Nevertheless, it would appear from the literature and several experiences that the Lean philosophy has added significant value to the customers/patients in healthcare, mainly in hospitals.

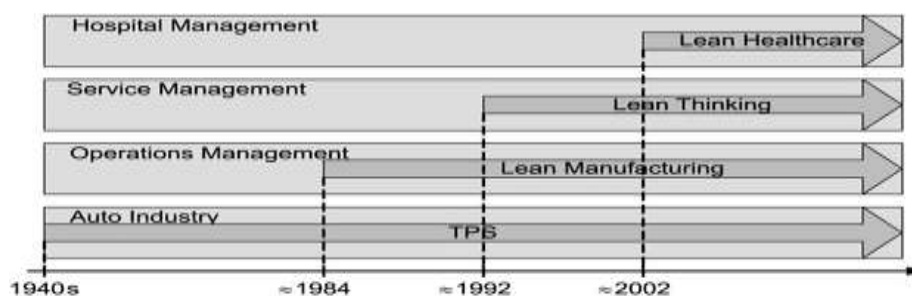


Figure 1: Appearance of Lean Healthcare Adapted from Brandao de Souza (2009)

2.1 Key concepts in Lean thinking The most important values that the organization needs to ensure the success of Lean project application are as follows:

Leadership:

Application of Lean is not attainable without the support of senior management. Thus, leadership must recognize the significant aspects of applying Lean. Although it is habitually necessary to handle change from the bottom up, it is essential that the leadership team of the organization heads up the transformation to Lean. A new approach (Dibia *et al.*, 2013) to leadership in the context of introducing and implementing Lean project management is that “leadership permeates vision and strong strategy which encourages and facilitates the integration of all infrastructure and people within the organization for the successful implementation of Lean. Such leadership directs, coordinates and facilitates the organizational processes bringing out the best in its

people". Here, leadership is active in terms of facilitating the needed strategies to allow for Lean implementation, and senior managers are responsible to involve their active participants in the change process and to facilitate the needed resources to allow for implementation. In terms of needed resources for the effective implementation of Lean project management, organizations must provide time for staff training and engage them in Lean activities (Dibiaet *al.*, 2013; AlBalushiet *al.*, 2014).

Shazaliet *al.* (2013) also found that "the level of continuous leadership commitment to Lean is a factor that considerably affected the outcome of Lean in practice". To implement Lean to achieve success in any industry, the leadership's commitment is absolutely essential; it gives the organization a sense of purpose and sets goals for continuous improvement (Dibiaet *al.*, 2013).

Culture:

Culture or organization culture, in general, consists of the values and practices that form the single psychological and social setting of the organization. The relation between culture and the application of Lean is somewhat sensitive. As stated with regard to Lean project management culture, before understanding how the Japanese do business, we have to understand the underlying culture; Lean practices need to be seen under the umbrella of their strong cultural origin (Guimaraes&Carvalho, 2012). It was recently found that the three core features of Japanese management thinking are "harmony and group loyalty, consensus in decision-making, and lifetime employment, all encompassed in the concept of respect for people" (Teich& Faddoul, 2013).

Ingelsson and Martensson (2014) found that "applying Lean requires a deep cultural transformation rather than simply implementing a set of Lean tools". Moreover, within Lean projects, the main way to change the organizational culture is "by doing". Therefore, you first need to change the way you think so that you can change the system. To be successful in Lean project implementation, leaders will first need to develop a clear vision of what the organization will come to be culturally. Bhamu and Sangwan (2014, citing Storch& Lim, 1999) proposed that "effective operation of the Lean philosophy requires clear communication, not only among operational units but also among all segments of the value stream". According to guidelines developed by the Institute for Healthcare Improvement (2005), "to help staff see and embrace the promise of Lean, leaders must create a clear vision statement that guides people to make the right choices. They must evaluate the organizational structure and work to flatten it, eliminating hierarchical layers and organizing staff into operational teams based on products or services".

Process:

"Going Lean" is a process that can only be realized over time. It is unlikely to be used to resolve competitive difficulties in the short term; it is a long-term commitment to continuous improvement. "Do it right" and "follow the process". The process includes the five Lean principles mentioned earlier. The right process will lead to the right result. In accordance with the Institute for Healthcare Improvement's (2005) report regarding a right process:

"It creates precisely the right value for the customer. In a perfect process, every step is valuable (creates value for the customer), capable (produces a good result every time), available (produces the desired output, not just the desired quality, every time), adequate (does not cause delay), flexible, and linked by continuous flow".

The basic idea of a Lean project includes defining the value of every specified process by differentiating steps, value-added from non-value-added and the elimination of waste, so that in the end, all steps will add value to the process. Insufficiency in any of these scopes yields a type of waste. Teich and Faddoul (2013) identify eight categories of waste (Muda in Japanese) as the following: overproduction, inventory, motion, transportation, over-processing, defects, waiting and unused talent of staff. In addition to the creation of value, the right process would also contribute to satisfying people and involving customers. This right process needs to be determined first by the customer and what he wants, and the activities need to be well planned to ensure the addition of value (Institute for Healthcare Improvement, 2005). Dibiaet *al.* (2013) argued that "in any system that is practicing Lean or going Lean, it is essential that the value stream be analysed and the process mapped out systematically.

2.2 Lean tools in healthcare

To recognize how a Lean project can be ensured successful implementation, a number of essential ideas and Lean practices should first be clarified. Knowing value as determined by the customer/patient and identifying and eliminating waste is the first step in Lean improvement initiatives. To match these ideas with the beliefs, a Lean management system with its tools such as value stream mapping, Kaizen, and PDSA cycle (Plan-

Do-Study-Act) are used. These tools are used in conjunction with each other to achieve better quality results in less space and less time. Each tool will now be further clarified.

Value stream:

Value stream mapping (VSM) is one of the most used tools of Lean approaches in healthcare. It graphically shows the services or product delivery process with the use of inputs, the amount of material or items passing through a process, and outputs.

A current state value stream map (CS VSM) is normally completed at the start of a project, highlighting the expected strategies for improvement by bringing together key participants of a chosen process. The improvement team is expected to generate and test their innovative ideas efficiently via Kaizen workshops. Future state value stream maps (FS VSM) are regularly designed through Kaizens to represent new ideas (Varkey *et al.*, 2007). Reijula and Tommelein (2012) state that “a value stream map (VSM) helps to spell out all work process steps (current-state map) while highlighting where value is generated and subsequently to eliminate unwanted variation hidden therein (future-state map)”. Representational flow charts are shown in Figures 2 and 3.

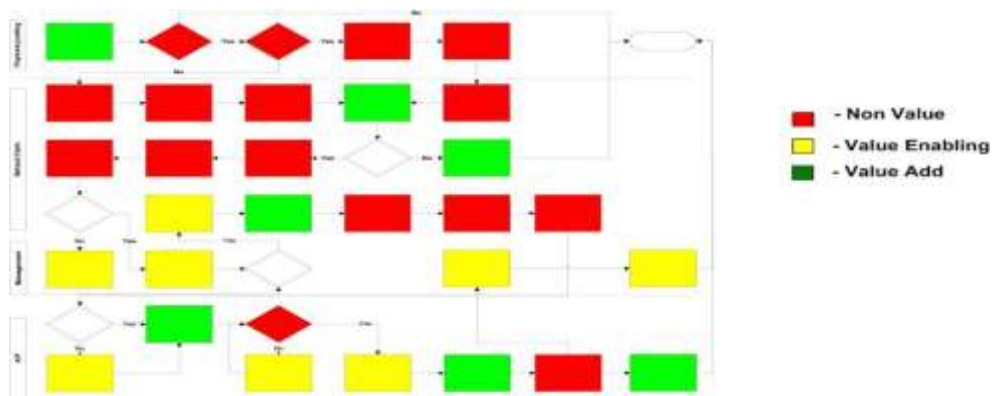


Figure 2: Example of a Current State Value Stream Map (CS VSM)
Adapted from Furfari (n.d.)

In Figure 2, a CS VSM is generated by those working in that process to make the work noticeable and to illustrate graphically all of the specific steps from start to completion of the process. Kim *et al.* (2006) showed that CS VSM includes “key measures such as process time (the actual time it takes to complete a particular step of the process), lead time (the total waiting time), and first-time quality (the percentage of time in which that step of the process is completed without defect)”.

The current state of VSM allows members to methodically identify and classify waste; it shows the records (supplies, equipment and customer waiting lines) stored amongst work processes. It also provides a chance for members to visualize the opportunities allowed to improve the current process by converting waste into value from the customer’s viewpoint.

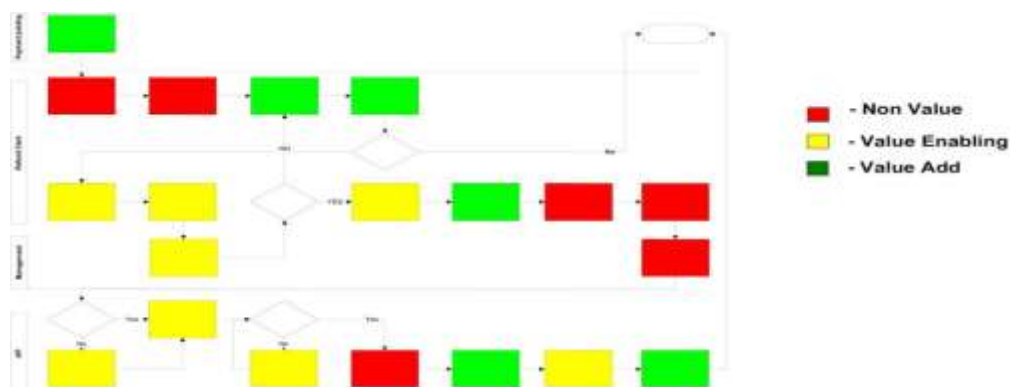


Figure 3: Example of a Future State Value Stream Map (FS VSM) Adapted from Furfari (n.d.)

In Figure 3, the FS VSM is created using the new and better ideas generated by the same team. The FS VSM signifies a progressive or ideal approach in which the process could be achieved. The team visualizes the future state map by examining how they should change the process to move towards perfection. Figure 3

illustrates an FS VSM for the same process mapped in Figure 2, with fewer steps in the process. Note that in the ideal map for the future state, most of the wasted time (non-value-added) between steps is eliminated, whereas at the same time, the value creating steps are stimulated, allowing workers to complete the same process of work in fewer steps and less time. It also “allows customers to “pull” value when they need goods or services provided by the organization, rather than having to do the usual requesting and waiting seen in healthcare and other service industries (Kim *et al.*, 2006).

After a map of the future state is approved, the serious work of putting into practice plans for reaching the future state initiates. There is a continuous circle between the CS and FS maps through the testing and implementation to develop the best strategy that the process should follow towards the last service or product. Finally, the hardest of all of the steps is “pursuing perfection” to improve everything workers do every day, which needs an organization to show commitment to implement and sustain the FS of a process, including a PDSA cycle.

A recent study highlighted the fact that “the Lean principles are applicable to any industry” (Womack *et al.*, 1990). Hence, the majority of the literature had reported implementations of Lean in different healthcare institutions with emphasis on the use and development of the value stream maps to identify sources of waste and eliminate them.

Kaizen:

Kaizen is a Japanese word that means “Change for the better”. Often, this is done by gathering the main members in the selected process’s Kaizen event for a concentrated sitting for four or five days to focus only on analysing current processes and implementing changes. According to J. Singh and H. Singh (2009) cited (Imai, 1986; Teian, 1992), Kaizen is a process of continuous improvement involving everyone, managers and employees. It is a strategy to contain the concepts, tools and systems in the larger picture of leadership that involves the culture of the people and is customer-driven. It is suggested that Kaizen is more than just a way to improve; it represents the daily struggles that occur in the workplace and the way to overcome these conflicts.

PDSA:

The PDSA approach includes “trial-and-learning”, which monitors the proposed solutions for improvement and is tested on a small scale before any changes to the system as a whole proceed (Varkey *et al.*, 2007). In an attempt to create the perfect process, participants must state objectives, make predictions and develop a plan to carry out the test cycle (Plan). Perform the test, document problems and unexpected observations and begin analysis of the data (Do). Then, summarize what was learned (Study), and finally determine what changes are to be made (Act), and decide whether the modified process is steady and sustainable.

Figure 4 shows the four repetitive steps over the course of small cycles, which ultimately leads to exponential improvements.



Figure 4: PDSA Cycle

III. CASE STUDY

The research is supported by a real example of a public hospital in the UAE that has succeeded in applying Lean, and by responses to the criticism of the opponents of Lean application in hospital projects based on a review of the literature of peer-reviewed publications that will be provided in the discussion section. Sheikh Khalifa Medical City (SKMC) in Abu Dhabi, UAE, was selected as a vivid example that has implemented Lean and succeeded in improving its system quality and reliability, and the data were collected using a qualitative ethnographic approach. This study uses ethnographic research to show how the third researcher, Chief Quality Officer and Senior Cardiologist Consultant at a large public hospital, spent his first three years on the job setting theory into practice. Ethnography studies the daily experiences of people and extends our understanding of the social developments within establishments. This study is constructed on the

personal experiences of the third researcher (auto-ethnography) to provide an insider's point of view. Data collection from auto-ethnographic narratives has been validated.

Sheikh Khalifa Medical City (SKMC) in Abu-Dhabi, UAE

The third author's auto-ethnographic vignette. Dr. Samer Ellahham, Chief Quality Officer and Senior Cardiologist Consultant at SKMC, a governmental hospital managed by Cleveland Clinic, shares his experience of the topic in the UAE:

"Our hospital began working with Lean in 2012, and has since then become a strong supporter of the process. But our hospital is by far not the only one, as Lean is being implemented in healthcare institutions across the globe. We believe the efficiency-focused methodology reduces waste and offers a solution to our increasingly burdened healthcare system", Dr. Ellahham says. "We found Lean to be a team building and engaging methodology, too. A typical Lean scene includes a group of all levels of care givers, from physicians, nurses and managers to administrators and housekeeping staff. They write out the path patients take to get to a target and look for waste that could be cut out of that flow. The process doesn't end with the meeting, as we are striving for continuous improvement".

To give a couple of examples, he says: "We used Lean in 2012 to address a key concern, namely, the Cardiac Door-to-Balloon time in primary angioplasty in our institution. It is a major life saving procedure, and we had challenges in meeting our goals. Our key project goal was to achieve Door to Optimal perfusion time of less than 90 minutes for all patients". He added, "The project scope was:

Start – Patient arrival at SKMC
Stop – Establishment of optimal perfusion flow
Includes – Heart attack
Excludes – All other cases

The team mapped the current process and identified several non-value adding steps. We were able to meet and exceed our target since then (more than 95%). The results are sustainable and lifesaving". Dr. Ellahham cited another Lean project in SKMC, saying, "In 2013, one of our goals was to reduce wait times for the outpatient pharmacy. Staff ran a Rapid Improvement Event, Kaizen, where a team mapped out patient flow and looked for possible improvements. After cutting out repetitive forms, removing unnecessary steps and creating a single patient registration spot, wait times dropped from an average of 40 minutes per patient to 5 minutes".

Concerning the benefit of the Lean initiative and the lessons learned in his experience, Dr. Ellahham says, in his capacity as Lean project leader at the hospital: "we confirmed that Lean is a management philosophy that eliminates activities that do not add value. It helped us focus on improving processes using simple tools. The care givers appreciated the "learn-by-doing approach" to performance improvement and capability building. Lean improved quality, decreased cost and decreased lead time. Most importantly we learned, from the literature and our experience, not to focus only on Lean tools but rather to understand Lean Philosophy and gradually permeate a hospital's culture with focus on change management. In our experience, Lean, when implemented appropriately, in a simple sustainable approach, does have great benefits in healthcare including patient safety, quality and patients' experience".

Although critics argue that lessons from a Japanese manufacturing system are not transferable to healthcare and that Lean's benefits remain unproven, Dr. Ellahham stated, "Lean is not a 'bubble'; it is a sustainable and practical philosophy of performance improvement. We tried to avoid using jargon to keep things simple and integrate the model in our organization".

IV. Results and discussion

In this study, we found through an ethnographic case study that hospitals that invest in Lean brought value to the patients and decreased unproductive work. The findings highlight the following benefits of Lean in healthcare projects:

- Lean performance improvement provides value to patients and their families
- Lean improves patients and caregivers satisfaction
- Lean can eliminate errors and provide optimal care to patients at the best possible cost when implemented effectively
- Lean can enhance process flow and improve throughput
- Lean methodology is applicable and valuable management tool in hospital projects

We proceed with a debate related to Lean methodology and its applicability to healthcare projects. The major points of criticism and our responses follow.

Lean is for manufacturing, not for a service industry - Mindset is everything!

The majority of the Lean implementations took the management philosophy and operational concepts of Lean from the manufacturing industry to the hospital context grounded on general experience and common sense. It might be a conceptual stretch for many in the healthcare community, and it will be necessary to master the most probable arguments against the application of Lean manufacturing concepts to the healthcare sector. The authors of this paper are of the view that Lean in hospitals has demonstrated its importance in explaining strategic guiding principles to streamline processes, cut cost, and progress in the delivery of services and products with high quality and at the right time. "Lean thinking is not a manufacturing tactic or a cost-reduction program, but a management strategy that is applicable to all organizations because it has to do with improving processes" (Institute for Healthcare improvement, 2005).

The authors believe that Lean has the potential to deliver patient care of better quality with additional efficiency and effectiveness in hospital settings by taking into account the benefits from the application of some of the Lean tools and techniques. Several existing problems of hospital practices and procedures can be solved by applying process improvement through Lean approaches. For instance, by Value Stream Mapping, all procedures in the patient's trips are examined as a whole from beginning to end: from diagnosis, through treatment, to discharge. Poksinska (2010) argued that "this allows for reducing waiting times and duplicate work and ensuring that the interrelated steps connect".

Kim *et al.* (2006) concluded their study by stating that "It is time for healthcare leaders and practitioners to evaluate how Lean techniques can be adapted and applied to addressing the pressing challenges of safety, quality, efficiency, and appropriateness in order to improve system reliability and timeliness". In response to the criticism that Lean is for manufacturing, we posit a change in mindset. This can give people a goal in their working lives and the ability to change attitudes. With a change in mindset, personnel start to judge Lean in a different way and are more prepared to participate in a company's improvement initiatives.

Difficulty to accept Lean Japanese jargon - Open to learn!

Lean has been criticized for its terminology and industry-specific jargon. It has been argued that Lean jargon including Japanese terms confuse rather than inform. From the point of view of the authors, there is plenty of Lean jargon, and several of the terms can appear "funny" when you start your journey of Lean. Lean as a word is itself jargon. Western practices in Lean applications relied on a misconception of the term "Lean", as in plain English, Lean means "skinny". It is significant to know that Lean philosophy is collected from several terms, for example, Muda, which means "waste". Knowing the Lean jargon definitions is essential to understand and learn how to apply them. Taking time to understand and learn what Lean and its related Japanese terms mean is healthier than criticizing Lean's key principles over jargon. "We tried to avoid using jargon as much as possible to keep things simple and incorporate Lean in our hospital", this suggestion by a Lean facilitator shows sensitivity to this criticism, while not allowing the linguistics of Lean discourage hospitals from learning more about it. In response to the criticism of the difficulty to accept Lean jargon, we posit that some jargon is necessary, but having an attitude of readiness to learn from others and being open to their culture is healthy and can make one smarter.

Lean leads to staff lay-off – Respect, give it to get it!

Lean may be viewed as leading to staff lay-offs or outsourcing in hospitals. The authors do not support this view. People are the true essence of Lean. Lean thinking should not be viewed as a set of tough tools and techniques that would suppress the motivation of employees, and generating a moral atmosphere for them is truly required. While some still raise the issue of the significance of showing respect for employees, most authors have argued that this is the strategic key to achieving the long-term sustainability of every Lean project. Rationally, the human aspects receive more investment, and initially, Lean does not need to be in all areas but can be introduced gradually, starting with key areas. In this context, Scottish Executive Social Research (2006), in reporting Radnor *et al.*'s study, highlights the advice to "consider areas which are keys to your service where improvements would result in better customer satisfaction, higher staff morale or the achievements of externally set targets".

Often, several divisions in hospitals are operated individually as independent "silos". Lean advocates such as Kim *et al.* (2006) argued that "Lean teaches that optimizing the performance of an individual area is insufficient, that the entire process flow, which requires cooperation of multiple operating units, must be improved in order to achieve meaningful and sustained improvement in performance". It is one of the benefits of Lean thinking; it is a new approach of thinking that needs behavioural change for many people to break down the "silo mentality" and to think sagely. Subsequently, this will lead to improved staff satisfaction, communication and team work among employees and worker empowerment (Reijula & Tommelein, 2012). In response to the criticism that Lean

leads to lay-offs, we posit that Lean leads to happier customers and staff based on respect and a holistic process approach; people are at the heart of Lean.

Lean training is expensive - Keep calm and train hard!

The opponents of Lean state that Lean training is expensive and resource intensive; however, the authors recalled the work of Poksinska (2010) when the latter claimed that “several authors stressed the importance of training their own Lean facilitators recruited from the hospitals instead of employing external consultants”. This point was well illustrated by a report commissioned by the NHS Confederation (2006) when Daniel and Mitchell reported that:

“Long experience of Lean teaches us that the only things that last are the things people do for themselves. To get started on a Lean journey, you may need to employ management consultants who have experience of what to do and how. But Lean is not, and should not become, a consultants’ gravy train. Any group of well-motivated hospital staff members can understand the principles of Lean. So the purpose of bringing in consultants is not to get the consultants’ help in solving a particular problem. It is for them to teach staff how to solve their problems by themselves.”

In this approach, persons educated in Lean will train others, and knowledge will be deployed gradually across the hospital. In terms of the cost, Lean like any planned hospital project needs financial capability to train employees, hire external consultants, etc., which is one of the critical factors for implementing Lean successfully. The profits of invested time and money arise in the future implementation, and as Poksinska (2010) said, “People’s knowledge, creativity and commitment seem to be important for building a sustainable Lean organization”. It is important to emphasize that Lean training courses should be mandatory and constant to ensure sustainable development. Lean must come to be typical execution and therefore self-sustaining. In addition, aligning Lean implementation with more strategic objectives might be a suitable idea to reach longer-term sustainability, as has been suggested by most scholars. In response to the criticism that Lean training is expensive, we posit that the right training based on our own knowledge and needs is cost-effective and avoids waste and excessive cost that can result from over use of consultants.

V. Conclusion

The research results suggested several actions and solutions drawn from the above discussion as critical success factors of Lean implementation in hospital projects:

- Lean implementation must be an integral part of the hospital’s long term strategy
- Develop leaders and people who understand and follow the Lean philosophy – build capability
- Develop a clear link between hospital goals, key objectives and Lean activities
- Seek true participation by all - people actually working in the process must be involved
Value must be defined by the patient
- Select a few priority projects to work on first
- Build a culture to prevent problems and waste rather than to simply inspect and fix
- Standardize tasks and processes
- Use time as the best overall measure

This has an important implication for healthcare organizations to move forward with a change in mindset.

The limitation of this study is due to the time limit; this research was conducted through an auto-ethnographic account of one individual’s (the third researcher’s) learning experience in implementing Lean at a single hospital, so it is not possible to generalize the results, probably it will not reflect other leaders experience and other hospitals. In addition, we call for further research to strengthen the position outlined in this study.

This research illustrates the potential link between high reliability healthcare and Lean methodology in hospitals to stimulate further discussion and enable more evidence-based decision making for the researchers and policy makers about adopting Lean as a performance improvement strategy. To the best of our knowledge this is the first study in the UAE calling for the application of Lean in hospital projects by linking academia, business and industry through research and is supported by a review of both sides of the argument.

This research shows the value of an auto-ethnographic view on Lean management learning as a tool for performance improvement in healthcare projects. The information gained through this study is supported by the third researcher’s experiences in fulfilling his role as a healthcare leader. This may service the reader exploring his/her own role in the field of healthcare leadership.

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