

Lean Healthcare Implementation in Southern Africa: A SWOT Analysis

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Abstract—As more and more healthcare service providers realize the imperative of improving quality and eliminating waste, lean healthcare is increasingly becoming a strong initiative. Though the concepts of lean have been frequently presented and advocated, the current state of adoption in Southern African countries faces challenges. There still exist a number of different perspectives as to what lean is fundamentally capable of in the healthcare setting. In this paper, we present an analysis of the strengths, weaknesses, opportunities, and threats associated with the application of the lean philosophy in healthcare. We collate expert views from a number of leading consultants, practitioners and academics from the Southern African region. The leading expert participants were selected based on their good knowledge and expertise in the field of lean. The study provides a useful resource for many researchers and practitioners concerned with research and application of improvement methodologies in healthcare to transform their healthcare organizations into high-performing healthcare delivery systems.

Index Terms— Lean, lean healthcare, SWOT analysis, lean healthcare adoption

I. INTRODUCTION

LEAN, derived from the Toyota Production System, is a systematic approach to identifying and eliminating waste through continuous improvement initiatives in the pursuit of perfection [1][2]. Common forms of waste include transportation, duplication, unnecessary movements, delays, overproduction, over-processing, and errors [1]. Thus, the primary aim of the Lean philosophy is continual process improvement by removing non-value added steps, and increasing customer value.

As stressed in [1], the main principles of Lean pertain to the concept of value, waste reduction, and continuous improvement (kaizen). However, the original Lean perspective, defined in terms of three Japanese concepts (*muda*, *muri*, and *mura*) goes beyond this view [2][3]. *Muda*

refers to waste or non-value adding activities, and therefore have to be reduced or eliminated. *Mura* relates to unevenness, calling for a stable demand that enhances smooth process flows. On the other hand, *muri* relates to excessive strain, arguing for good working environment that reduce strain and injuries on the worker. It can be argued that there are two ways by which customer value can be increased, first, by reducing waste, the cost of a product or service, and, second, by increasing the value-adding activities without increasing the cost of the service or product [1-4]. As pointed out in [5], Lean can be viewed as a management practice that is centered on continuous improvement by increasing customer value or reducing non-value adding activities (*muda*), process variation (*mura*), and poor work conditions (*muri*).

Continuous improvement seeks to remove non-value added steps or waste. Taiichi Ohno initially defined wastes in the manufacturing context [1]. With the adoption of Lean in service systems, the phenomena were gradually adapted to service wastes. Recently, the National Healthcare Service Institute for Improvement and Innovation (NHSI) adapted the phenomena to healthcare wastes [6]. Table I presents a list of healthcare service wastes.

Effective implementation of Lean removes duplicate

TABLE I
DEFINING HEALTHCARE WASTES

Original Waste	Healthcare Waste
1. Transportation	Staff walking to the other end of a ward to pick up notes. Central equipment stores for commonly used items instead. Items located where they are used.
2. Inventory	Excess stock in storerooms that is not being used, patients waiting to be discharged. Waiting lists.
3. Motion	Unnecessary staff movement looking for paperwork, e.g. drug sheets not put back in the correct place, storing syringes and needles at opposite ends of the room. Not having basic equipment in every examination room.
4. Waiting (Delay)	Waiting for patient theatre staff results, prescriptions and medicines. Waiting for doctors to discharge patients.
5. Over-production	Requesting unnecessary tests from pathology Keeping investigation slots 'just in case'
6. Over-processing	Duplication of information asking for patient data several times Repeated clerking of patients
7. Defects/Errors	Re-admission due to failed discharge and adverse drug reactions Repeating tests due to initial incorrect information

Manuscript received March 12, 2015; revised April 10, 2015.

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processes and unnecessary procedures such as multiple recording of patient data, movement of patients between wards, excessive waiting, variable discharge processes.

The purpose of this paper is to present an analysis of the strengths, weaknesses, opportunities and threats of Lean healthcare management. Strengths and weaknesses are positive and negative internal factors, respectively, while opportunities and threats are external factors. The ultimate goal is to present an information resource that can assist decision makers when formulating appropriate strategies for effective implementation. This can be useful for analyzing a business process, its resources and its environment.

The rest of the paper is structured as follows: The next section outlines the research methodology for the study. Section III presents the research findings. Key lessons derived from the research are then presented in Section IV. Conclusions and further research prospects are presented in Section V.

II. RESEARCH METHODOLOGY

This research used SWOT analysis, a strategic-level analysis diagnostic tool, which stands for strengths, weaknesses, opportunities and threats. Normally, strengths refer to the internal strong points of an organization or the areas that the organization does well above its competitors, with little or no competition. On the other hand, weaknesses are the feeble areas of the organization, that is, the factors which do not meet the expected level of standards. Furthermore, opportunities are provided by the environment within which the organization operates. These may be associated with the market, competing organizations, industry, the government, and the prevailing technologies. Conversely, threats pertain to the factors that can endanger the survivability of the organization. However, the aim is to recognize the threats on time and turn them into opportunities.

In carrying out the SWOT analysis of the lean healthcare management principles in Southern Africa, we collated expert views from leading consultants, practitioners and academics from the region. Leading expert participants were selected based on their expertise in the Lean, specifically in

Strengths:

What are the strengths of lean in healthcare? What are the characteristics of lean that give it an advantage?

Weaknesses:

What are the weaknesses of lean in healthcare? What are the characteristics of lean that give it a disadvantage?

Opportunities:

What are the opportunities of lean in the healthcare sector? What are the elements in the healthcare sector that lean could exploit to its advantage?

Threats:

What are the threats to lean in the healthcare sector? What are the elements in the healthcare sector that could cause trouble for the lean projects?

the healthcare field. The experts were contacted through an online questionnaire tool, allowing them to give independent views on the strengths, weaknesses, opportunities and threats associated with the application of Lean principles in the healthcare sector. Participants were encouraged to share their knowledge and experiences in the transformation of healthcare institutions into high-performing healthcare delivery systems. The questionnaire tool was structured as in Fig. 1.

Participants were provided with a brief explanatory notes on common lean tools applicable to healthcare. Table II lists the lean tools considered.

III. RESEARCH FINDINGS

The following are the detailed responses from selected experts in lean management. Names are withheld for anonymity.

A. Expert A

Expert A is an established professor of operations management who consults in lean principles and applications and has led several projects in lean management in Southern Africa. The SWOT analysis according to Expert A is outlined as follows.

Strengths:

AS1: Ultimately, lean management is not only about problem-solving, it is more about developing people's problem-solving capability.

AS2: Lean healthcare emphasizes cutting waste while placing value on patients.

Weaknesses:

AW1: Lean management is not a quick fix, that is, it requires consistent holistic involvement over a long term

AW2: Effective lean implementation requires deep organizational transformation to be sustainable.

Opportunities:

AO1: The gap between required healthcare outcomes and current performance is large; therefore the application of Lean has potentially huge benefits.

Threats:

AT1: Short-term thinking by top management, due to lack of knowledge of long-term gains.

AT2: Well-intentioned but inexperienced people creating unrealistic expectations about what Lean can do.

B. Expert B

Expert B is a consultant in Lean, with a focus on manufacturing and service industry. He is also an Assistant Professor in Industrial Engineering. The SWOT analysis according to expert B is as follows:

Strengths:

BS1: Lean can help healthcare institutions reduce the cost of service delivery.

BS2: With the current numerous unnecessary activities in healthcare, the impact of lean will be quite high.

BS3: A proper Lean implementation makes one area

Fig. 1. Research questionnaire tool

more efficient allowing for redeployment of resources to another area.

Weaknesses:

BW1: Lack of proper performance management structures in healthcare institutions makes it difficult to measure the lean advantage.

Opportunities:

BO1: Losses have been evident in private and public healthcare institutions; therefore, initiatives directed at minimizing losses are most welcome.

Threats:

BT1: Top management lack exposure in regards to what lean can achieve for them, therefore uptake can be inhibited.

BT2: A holistic organizational approach is lacking in most healthcare organizations, yet an essential element for effective Lean healthcare.

C. Expert C

Expert C is an Assistant Professor in Industrial Engineering, researching and consulting in Lean Manufacturing, and Service Operations Management.

Strengths:

CS1: Lean is easy to implement compared to other continuous improvement initiatives.

CS2: Standardized collection of Lean methodologies and tools.

Weaknesses:

CW1: The healthcare structure is still very hierarchical, with physicians as the dominant decision makers. Conversely, Lean culture requires teamwork.

CW2: Sustainability, though not a product of Lean itself, it is rather a common denominator essential for process improvement initiatives.

TABLE II
LEAN HEALTHCARE TOOLS

Lean Tool	Brief Description	References
1. Continuous improvement (Kaizen)	Working together proactively for incremental improvements.	[1], [2], [3], [4], [7], [9], [10]
2. Continuous flow	Smoothed workflows with minimal build-up.	[7], [8], [9], [11-13]
3. Value stream mapping	Process mapping to highlight opportunities for improvement and customer value.	[9], [10], [15], [16], [17]
4. Waste (muda) elimination	Elimination of non-value adding activities.	[7], [8], [10], [12]
5. Standardized Work	Documented procedures that capture best practices.	[5], [8], [10], [18]
6. 5S	Organize the work area to eliminate waste.	[1], [8], [13], [16], [17]
7. Gemba (The Real Place)	A philosophy that reminds us to spend time at the place where real action occurs	[1], [2], [7], [13], [15], [17], [18]
8. Bottleneck Analysis	Improve the performance of the most limiting activity	[7], [12], [9], [15], [18]
9. KPI-Key Performance Indicators	Metrics to track and encourage progress towards organization goals.	[3], [4], [7], [12], [14], [15]
10. Training or Education	Educate and develop people and grow leaders	[1], [2], [5], [7], [8], [9]

Opportunities:

CO1: Most healthcare institutions are aware of the need for continuous improvement, improved housekeeping, labor efficiency, standardized work, smooth workflow, service times and cutting costs.

Threats:

CT1: Job losses - Lean is sometimes used as a method to reduce headcount, which kills Lean efforts.

CT2: Quick implementation of lean can be unsustainable and disadvantaging.

D. Expert D

Expert D is a professor in operations management and a consultant in lean manufacturing.

Strengths:

DS1: It is also very broad based in that it can be applied to every situation.

DS2: Good track record for healthcare institutions who have adopted lean tools.

Weaknesses:

DW1: Lack of clarity on who the customer is. The patient is the primary customer, but not from the market economy perspective.

DW2: There is a general lack of lean expertise inside the healthcare sector to teach workers about; experts may have to be hired from the sectors such as manufacturing.

Opportunities:

DO1: Most hospitals are aware of customer pressures for improved service quality

Threats:

DT1: Hospital units mistakenly work autonomously such that improvement on one unit may even cause problems at another unit.

E. Expert E

Expert E is a Senior Lecturer in Industrial Engineering, researching in Lean and other continuous improvement tools, mainly in the manufacturing sector.

Strengths:

ES1: Lean comprises a wide range of tools that can be applied to almost every situation present in healthcare institutions in Southern Africa.

Weaknesses:

EW1: The notion of customer is ambiguous in Lean; other customers, e.g., family members, caregivers, decision-makers, local communities and taxpayers, also need to be considered.

Opportunities:

EO1: The recent push for cutting service costs has raised consciousness for going lean, cutting costs and service times.

Threats:

ET1: Healthcare is a complex system with many interdependent units.

ET2: Improving value streams involves several healthcare units, which may not be ready to change.

The above research findings are a potential excellent knowledge resource for researchers, consultants and practitioners in the healthcare sector.

IV. KEY LESSONS FROM THE STUDY

Deriving from the SWOT analysis in this study, the key factors that contribute to the success of Lean healthcare implementation are outlined as follows:

- It is essential to instill holistic and systems thinking in healthcare organizations, as opposed to hierarchical thinking.
- In carrying out value stream mapping, it is vital to re-define the term customer in the context of lean healthcare, to include other influential stakeholders such as family members, caregivers, local communities and taxpayers.
- Commitment and full involvement of healthcare staff is essential in the lean implementation; specialist skills and experience are useful for improvement.
- It is essential to train and develop employees, giving them responsibility to make improvement initiatives.
- Management support at all levels; top-level managers should show interest in the Lean and provide sufficient resources for lean implementation.
- The Lean philosophy should be taught and implemented as a tool for improvement and not as a way of reducing headcount, leading to job losses.
- It is also critical to educate employees at all levels regarding the medium to long-term benefits of Lean healthcare before implementation.

Conclusions and further research prospects are presented in the next section.

V. CONCLUSIONS AND FURTHER RESEARCH

Lean healthcare is increasingly becoming a strong initiative in healthcare institutions. The purpose of this research was to investigate from experts in lean in Southern Africa, the strength, weaknesses, opportunities, and threats associated with lean healthcare. Leading expert participants were selected based on their expert knowledge in lean healthcare. The research presented an excellent knowledge resource for many researchers, consultants and practitioners involved in research and applications of the business process improvement methodologies.

ACKNOWLEDGMENT

The authors would like to appreciate Dr Anton Grutter, University of Cape Town, South Africa, for his valuable contributions in this study.

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