

Lean and Sustainable Continuous Improvement: Assessment of People Potential Contribution



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Abstract Many industries all over the world have been increasingly adopting Lean Management practices, from manufacturing to service sectors. Notwithstanding the demonstrated astonishing benefits in operational performance of Lean, many firms strive to successfully sustain Lean and its gains in the long-term. Many authors in the literature relate these failures to an exasperate effort to correctly implement the so called “practices” of Lean. This excessive focus on practical aspects led companies to completely neglect the human side of developing people in order to create a base for sustainable continuous improvement system that Lean implementation entails. For that reasons, increasing attention has been placed by academic researchers towards the importance of the human side in successfully sustaining Lean implementation and Continuous Improvement Programs. Despite this increased attention, only few studies have tried to analyze this aspect from a broader and comprehensive perspective. Indeed, before the contribution of this dissertation, no studies in the literature have been able to identify a comprehensive model for assessing the development of people’s potential to contribute at the sustainable continuous improvement. This paper represents a preliminary research attempting to fill this gap, proposing a new assessment model for monitoring people development.

Keywords Lean · Sustainable continuous improvement · Assessment model

1 Introduction

Even if Lean is recognized as one of the major managerial approach for leading companies to success [1], some author argue that wrong application of the tools and

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techniques inherent to lean philosophy may also entail wasting resources up to 30% more than before [2].

These outcomes partially lie in the nature of lean implementation, which is complex, time-consuming, and needs a substantial amount of human resources and effort [3, 4]. In the literature, failures in implementing lean are commonly related to the complexity of implementation, lack of considering other operations management practices, not coherent planning and strategy, and difficulty in adapting the concepts to the specific context [5]. Companies usually do not really understand lean concepts, thus making critical mistakes like focusing on reducing some forms of wastes and disregarding others [6]. Tortorella and Fogliatto [7] reports that sometimes a superficial approach leads lean programs to fail, while [8] shows the existence of inconsistencies between what companies really feel important about lean and how these factors are executed. However, the real problem is that companies fail in sustaining the change lean brings in the organization, believing that the first results achieved will last forever, and ever better ones will come without improvements or with unsustainable ones. Thus, two major problems affect lean implementation: (i) not improving what already done or failing in continuous improvement, which is one of the key principles of lean; (ii) not creating a robust and large base of people capable and devoted to continuous improvement process.

Then, this preliminary research focuses on the latter point, aiming at creating an assessment model for evaluating the real strength of a Lean organization that is composed by the employee participating in the continuous improvement process. In order to do that, a case study has been carry out and preliminary results are presented in this paper.

2 Background

Despite the clear evidence highlighting the benefits related to Lean Manufacturing, the literature suggests that many companies fail in the implementation of such a managerial system, thus failing in gaining sustainable competitive advantages against competitors. Indeed, the adoption of Lean tools and techniques does not automatically bring to a successful implementation of Sustainable Continuous Improvement (SCI) system that is sustainable over the long-term. Many companies all around the world struggle with the implementation of Lean Management practices, meaning that simple implementation of the different tools does not ensure sustainable increased performance. The evidence suggests that two out of three organizational change processes fail [9] and in many cases companies that fail in implementing Lean return back producing according to their traditional means. The isolated use of tools such as 5S, SMED, JIT and other techniques, could bring strong improvement of performances that cannot be lead to SCI system if the company is not able to change the organizational culture [10].

The performance advantages that lean can enable are strictly related to a strong commitment to continuous improvement enabled by people development [11]. Continuous improvement consists of highly frequent minor changes carry out by many that, added up, may entail a revolution, and result in a positive impact on performance [12]. Some authors consider it a culture concerned with quality as an integral part of the processes within the organization [13]. Similarly, Rossini et al. [14] state that continuous improvement is a pervasive culture that focuses on eliminating waste in the processes within all organization's levels, requiring everyone to look for problem root causes and sources of variation, and try to get rid of them.

The benefits of implementing continuous improvement programs are many and involve the company from a broad perspective [15]. As mentioned above the organizational learning is the basis for continuous improvement, but the relationship is still valid if observed at the opposite. CI programs encourage organization to undertake a process of learning through which continuously revising assumptions and values, and triggering new problem-solving schemas [16]. Employees come to be more positive and satisfied, showing a greater sense of responsibility and desire to learn and develop new skills, as well as a deeper understanding of the impacts of their actions on the process as result of CI [17]. A strong decrease of turnover and absenteeism can be observed, in addition to a higher productivity and better quality [18].

However this process of change is not simple, and nowadays it has been recognized that measuring level of leanness only looking at practices is not enough. Companies must be able to measure their strength in doing continuous improvement.

Though Continuous improvement is extremely important and has a huge impact on companies from a very wide perspective, its implementation results difficult and particularly hard to sustain in the long term [19]. What is really missed is a sustainable implementation of lean and continuous improvement. Sustainability is a quite ambiguous term, which is defined in several different ways in the literature. As an example, Flumerfelt et al. [20] argue that sustainability is nothing other than an employee based process improvement. Other authors affirm that sustainability is the company's ability of developing new knowledge to cope with ever coming problems and inefficiencies. The company must be capable of involving employees to successfully sustain a change, and pushing them to think and learn so to increase knowledge, thus reaching what is usually referred to as learning organization [21]. From a completely different perspective.

Therefore, there is not a clear pattern in the literature on how to measure leanness level and SCI in the company and this paper proposes a new point of view, which is focused on SCI and, more in detail, on the people and their potential impact in the creation of a SCI system.

3 Methodology

Case studies present a fundamental feature in respect to the actual research to perform. They can rely on a variety of sources of evidence that usually are not available for other

explanatory methods [22]. In fact, case studies can leverage information coming from documents, artefacts, interviews of people part of the study and direct observation of the studied events [22]. This characteristic is fundamental for studying a current phenomenon like Industry 4.0 that is still characterized by a lot of uncertainty. Lastly, differently from what happens with experiments, in which the investigator has full or partial control over variables, case studies do not require control of behavioural events [22]. Then, the case study is the method that best fits the previously mentioned criteria and, hence the final aim of the research.

4 Case Study

4.1 *The Company*

Ghelfi Ondulati S.p.A. (Ghelfi) is an Italian SME (small-medium enterprise) operating in the corrugated cardboard industry since 1952. Ghelfi mainly operates in Italy in fruit & vegetables and food industries, but it has also an important customer base in Europe (in particular in France) and some clients in northern Africa. The company represents the stereotype story of today's Italian companies: a successful SME, created by scratch of an entrepreneur after the Second World War and now led by the third generation of the family. In this context, the governance (composed by the family and few other employees) developed a great vision for the company: developing people capabilities, at all levels, in order to create the base of management for the future and so to prepare the exit of the family from the operative management of the company.

This vision led Ghelfi bet on Lean journey for the growing of its employee.

4.2 *The Case*

A Lean program has been set and many people have been involved. The company did not focus on the operational performance results (let's say, not only), the company wanted to measure and evaluate how people were becoming stronger in company working life, how they were proactive and successful in improving Ghelfi processes. Within this point of view, traditional measurement, based on operational performances, appeared not sufficient anymore.

The necessity of a new measurement system model that includes the growth of employees showed-up. This research is the preliminary representation of a new measurement system model developed by the Lean Excellence Centre of Politecnico di Milano that assesses employee's capability in pursuing continuous improvement.

4.3 The New Measurement System Model

The growth of the people has been measured along two dimensions: a vertical dimension, named “people strength”, which considers the capability of people in problem solving and in leading, and a horizontal dimensions, named “people view”, which considers the extension of an employee experience in different areas of the company.

4.3.1 People “Strength” Dimension

This dimension evaluates employee growth in three main topics: Lean techniques (LT), A3-PDCA (A3), Leadership capability (LE).

LT’s sphere assesses employee’s capability in the knowledge and the correct use of traditional Lean techniques (i.e. 5S, SMED, Pareto analysis ...).

A3’s sphere assesses employee’s capability of problem setting and of pursuing correctly the Deming cycle, i.e. passing through a robust analysis instead of jumping to solution.

LE’s sphere assesses employee’s capability of leadership: the emphasis of this dimension is the growth of a person that changes from being an agent of change to be a facilitator and a coacher for new agents of change, from being a person that is led to be a person that is a leader of the continuous improvement process. Figure 1 depicts an assessment for one experienced employee in Ghelfi.

Fig. 1 Single person assessment model for the “strength” dimension

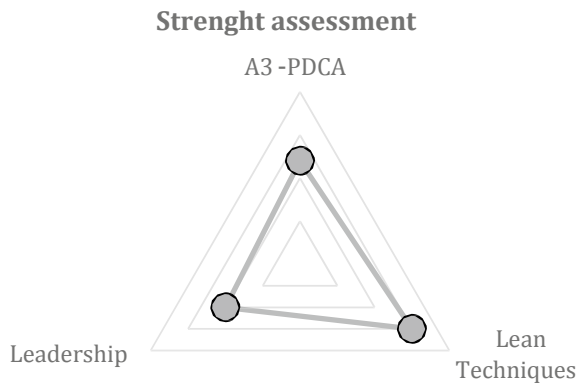


Table 1 People view assessment for 10 employees of Ghelfi

People	Company functions						
	Sales-indust.	Sales-fruit	Logistics	Purchasing	Production	Tech. design	R&D
AB				O	X	O	
CD					X	O	O
EF							X
GH				X	O	O	
IL				O	O	X	
MN	O	X	O				
OP	O	O	X				
QR	O	O	O	O	X	O	O
ST	X	O	O				
UV	O	X	O				

X: in charge of that function; O: in contact through improvement projects

4.3.2 People “View” Dimension

This dimension evaluates employee’s growth in overall knowledge of the company. With the overall knowledge we mean the consciousness of people of what happens (procedures, people, processes) in company’s functions different from the one where they are used to work. The importance of this dimensions comes-up from the experience that the biggest opportunity of innovation and of improvement lay in the interrelation between different departments. So, the wider the employee’s knowledge of the company businesses, the bigger the capability of the employee of proposing and pushing continuous improvement. Table 1 represents the assessment of a Ghelfi’s employee view.

5 Conclusions

Although more than two decades have passed since the publication of Womack’s book, both academic and practitioners’ worlds are still in strong consensus with these argumentations. In their literature review [23] state that the continuous improvement process changes the role of employees and the separation between the so called white-collar and blue-collar is no longer possible. Employees are expected to conduct the continuous improvement themselves, embracing and internalizing the company’s problem-solving procedures and should be motivated to approach the daily improvement as a natural behavior, driven by a wish of personal development and the sense of achievement. Hence, employees’ engagement and long-term development is a fundamental characteristic for the sustainability of Lean Production Systems. According

to the centric view of people development, it is clear the necessity to have a measurement system which support this view. This paper attempts to fill this lack in the literature and propose a preliminary research conducted in a real case. An evaluation framework based on two dimensions has been proposed and the aim of this research is to continue to investigate in order to create a complete and more robust framework that practitioners could use for assessing their SCI systems.

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