

Measuring the Starting Points for a Lean Journey

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Abstract

Purpose – The purpose of this paper is to emphasize the importance of measuring the starting point of improvement work focusing on soft values and to present one way of measuring the starting point of a Lean implementation. The purpose is also to describe the Lean implementation planned within a municipal division and also to present their measured starting conditions.

Methodology/approach – A literature study, with Lean implementation, measuring starting points for improvement work, soft values and the effects of the improvement work in focus has been carried out. Documents from the planned Lean implementation within a municipal division have been studied. To measure the conditions for the implementation a previously conducted measurement approach that measured health-related Quality Management was used.

Findings – The paper contains an argument for the importance of measuring the effect of a Lean implementation with a focus on soft values and measuring starting points. A description of one planned Lean implementation within a municipal division and their starting conditions are presented.

Practical implications – To measure the conditions at the starting point of a Lean implementation gives managers information to help them focus on important improvement areas. A description of a Lean implementation can help other organizations to plan their implementation.

Keywords Lean, Quality Management, co-worker health, implementation, measuring starting points, improvement work.

Paper type Research paper

Introduction

Global competition is increasing throughout the world, and this together with the low-wage economies of the developing world and the need for transparency and accountability poses a significant challenge to operations managers in the manufacturing, service and public service sectors (Radnor and Barnes, 2007). Measuring is the starting point for improving operational performance but the challenge lies in measuring the right things and using those measurements as the basis for managing performance improvement (ibid). During the last few decades, management concepts such as Lean Production, Total Quality Management (TQM), Business Process Reengineering and Integral Health Management have been used to promote changes and development toward business excellence, see for instance (Zwetsloot and Pot, 2004; Docherty, 2002). “TQM is a management system capable of creating an open or receptive to innovation organizational culture” (Santos-Vijande and Álvarez-González, 2007). Ingelsson et al. (2010) claims that one of the major factors for success when implementing TQM or Lean seems to be the culture that already exists within the organization. This is in line with Achanga et. al., (2006) and Bhasin & Brucher, (2006) who maintain that the principles and values should be present in an organization when starting the journey towards a successful Lean transformation. According to Santos-Vijande and Álvarez-González, (2007) “the development of an organizational culture is not an easy task, as it consists of a group of shared norms and values formed over a long period of time and that influence the way the organization functions.” Also when a workplace health promotion program starts, it is necessary to analyze the organization, especially the culture (Goldgruber and Ahrens, 2010).

According to Andersson et al (2006) TQM, Lean and Six Sigma have many similarities such as origin, methodologies, tools and effects. Radnor and Boaden (2010) maintain that Lean is just another type of organizational change which represents another opportunity for the public sector to understand the process of change. Kollberg et al. (2007) see Lean thinking as a part of a larger management shift in order to plan for changes in mindsets and work places. Radnor and Boaden (2010) argue that Lean includes elements from concepts such as Just In Time (JIT), TQM and business process engineering (BPR). One way to achieve substantial cost savings and quality improvement is applying Lean (Radnor and Walley, 2008). Ingelsson et al (2010) maintain, that to achieve a successful Lean transformation, the need for a shared value base is just as important as within TQM. Andersson et al (2006) mean that Six Sigma and Lean are excellent road-maps that can be used in order to strengthen the values of TQM (ibid). The values that are most commonly referred to in quality management literature are: customer orientation, leadership commitment, participation of everybody, continuous improvements, management by facts and process orientation (Sila and Ebrahimpour, 2002). These are similar to the critical TQM factors according to Motawi, (2001), who compiled a list from a literature review: top management commitment, quality measurement and benchmarking, process management, product design, employee training and empowerment, vendor quality management, customer involvement and satisfaction.

A prerequisite for a successful implementing of Lean seems to be that there are at least some devoted leaders in the organization, leaders that are committed to the values within Lean and TQM and who are willing to live by and act according to these values (Ingelsson et al 2010).

There are a number of lean process measures for manufacturing (Petersen and Wohlin, 2010), but measuring productivity is different when it comes to non-manufacturing organizations (Hamid et. al. 2011). Sha and Ward (2007), also claim that it is often difficult to measure Lean Production directly due to the fact that it is conceptually multifaceted, and its definition spans philosophical characteristics. When measuring the effect of successful TQM, the framework should include hard and soft measures and should include perceptive data from co-workers, (McAdam and Bannister, 2001). Motawi (2001) maintains that measurements for organizational effectiveness and success have mostly been focused on financial figures or hard measurements such as cost of quality, reduced inventory and delivery dependability. Saad and Patel (2006) also stress that there have been few attempts to measure the performance at inter-organizational level and these have been essentially focused on tangible and financial factors. The management literature encourages the use of soft measures in the analysis of organizational progress according to (Stone, 1996), and she maintains that those measures can be use in many diverse ways both in monitoring or to include cultural change. According to Radnor and Boaden (2010) it is important that analysis and development of Lean in public services continues to be an interaction of practice and theory.

All in all, it seems that it is not easy to measure the effects of an improvement work like a Lean implementation, especially not the soft measurements such as values. A prerequisite for measuring the effects is to measure the starting point, before the implementation starts. It also seems that applying improvement approaches like Lean within the public sector has its difficulties.

The purpose of this paper is to emphasize the importance of measuring the starting point of improvement work focusing on soft values and to present one way of measuring the starting point of a Lean implementation. The purpose is also to describe the Lean implementation planned within a municipal division and also to present their measured starting conditions.

Measuring the effect of improvement

According to Radnor and McGuire (2004), the performance measurement is the act of measuring the performance whereas performance management aims to react to the outcome measure using it in order to manage performance. Since 1997, there has been a drive to improve the effectiveness of public services in the UK, through the use of private sector principles (Radnor and McGuire, 2004). One example is Lean production, which is a well-established management concept in many manufacturing organizations (Kollberg et. al., 2007) where the public sector's interests now are increasing. This can be seen as a result of shifting the traditional way of controlling the public sector to be more based on a market-oriented mindset (ibid). The aspects for performance management in the public sector to be considered are; strategy, process, people and system (Radnor and McGuire, 2004). Changes in one of these aspects result in changes in any of the other (ibid). Lean in public services should be about adaptation rather adoption without adaptation, (Radnor and Boaden, 2010).

Ingelsson et al (2010) showed in a literature study that there are similar problems when implementing Lean and TQM. Emiliani (1998) maintains that it will take five to ten years for an organization to practice sustained Lean behaviors. Like TQM it is not an isolated program, but a never-ending process or journey, (McAdam and Bannister, 2001). In the beginning the focus of efficiency improvements within Lean was on the shop floor (Emiliani, 1998). Recently, the administrative processes in organizations have started to come under scrutiny and massive amounts of waste have been found (ibid). Emiliani (1998) asserts that the motor for further improvement in business as a whole is the practice of lean behaviors, performance by elimination of waste within functions and by the sustaining of internal and external interfaces. To remove the waste and improve the flow, it is important to understand the current status in terms of waste and flow and that is accomplished through visualization and measuring, (Petersen and Wohlin, 2010). Lean adaption in the public sector should first engage with the principles of customer and process view, flow, and reduction of waste through the use of simple tools and techniques rather than embarking on the implementation of the more complex tools used in manufacturing (Radnor and Boaden, 2010). Performance measurement can become a tool for continuous service improvement through analysis of data (Hernandez, 2002). To achieve this Radnor and McGuire (2004) argue that there has to be an understanding of the relationship between strategy, people, organizational form/design and performance systems, particularly within the public sector. There is also a need to understand and measure the performance which is often considered to be the efficiency and effectiveness of the transformation process, (Radnor and Barnes 2007). Efficiency focuses on measures concerning the productivity of a process, whereas effectiveness focuses on the notion of the appropriateness of the outputs of the process, which is a broader set of measures (ibid). When measuring the effectiveness, the emphasis is on softer measures such as levels of innovation, motivation and customer retention, (ibid). In the public sector, the evidence of tangible benefits from Lean implementation is not always as robust as in the manufacturing sector, (Radnor and Boaden, 2010). Intangible benefits include a better understanding of customers, cross-team synergies, and an increase in co-worker motivation and morale (ibid).

It is important to design a measurement system that reflects the initiatives taken when a new management implementation such as adopting lean thinking principles is carried out (Kollberg et al, 2007). Many public managers attempt to apply Lean without fully understanding its underlying principles which leads to simply a set of tools and techniques rather than a fundamental shift in culture and approach, (Radnor and Boaden, 2010). As the failure to create a shared value base is pointed out as one main reason for not successfully implementing TQM and Lean (Ingelsson et al, 2010), it seems important to measure these values. Nevertheless, the measuring of values and organizational culture, e.g. the soft side, appears to be lacking within both concepts (ibid). There are however some questionnaires and measurement approaches that measure whether certain values permeate the organization, Ingelsson et al, 2010, Lagrosen et al, 2012).

One way of measuring the starting points of a Lean implementation

A measurement approach was developed in order to help managers examine to what extent the health-related Quality Management values 'Leadership Commitment' and 'Participation

of Everybody' permeated their organization (Lagrosen et al, 2012). The measurement approach can be used to point out to what extent the organization is practicing the health-promoting values of Quality Management and in what areas improvement is needed to increase co-worker health (Bäckström, 2009; Lagrosen et al, 2012). The measurement approach can also be used longitudinally to assess status before and after carrying through an organizational change (Lagrosen et al, 2012).

Earlier research show that the value 'Leadership Commitment' and the value 'Participation of Everybody' are important to support sustainable health among co-workers when Quality Management is practiced (Bäckström, 2009, Lagrosen et al, 2012). The underlying dimension of the values 'Leadership Commitment' and 'Participation of Everybody' regarding the relation to co-worker health was examined by (Lagrosen and Bäckström, 2005; and Lagrosen et al, 2010). In that study, it was pointed out that integrity, presence and communication, empathy and continuity are underlying dimensions of 'Leadership Commitment'. Development, being informed and influence were found to be the underlying dimensions of the value 'Participation of Everybody'. These dimensions were also found as established methodologies, values and practices in successful organizations that have achieved good workplace health and were working accordingly to the TQM values (Bäckström, 2009). The measurement approach has also been used to evaluate health promoting activities, (Bäckström et al, 2012) and to measure the effects of Appreciative Leadership, (Åslund et al, 2011). The approach is easy to use, when analyzing and evaluating the results in order to get a holistic picture, an importance which is emphasized in, for instance, Zwetsloot et al, (2010).

Methodology

A literature study was carried out. The focus was on Lean implementation, measuring starting points for improvement work, measuring soft values and measuring the effects of improvement work. A case study was also done where documents from the planned Lean implementation within a municipal division were studied. The starting point conditions within the municipal division were measured by means of an earlier conducted measurement approach which measured health-related Quality Management (Lagrosen et al, 2012).

Lean implementation within a municipal division

Sundsvalls Kommun is a municipality in the middle of Sweden. It has nearly 96 000 inhabitants and with a mean age of 42 years. It employs 7 000 people. In 2012, Sundsvalls Kommun started to implement Lean. The Service and Technical Division is one out of nine divisions in the whole municipality and employs more than 500 staff. The Service and Technology Division is divided into four sub units; Addera, Gallant Fastighet and Stab. The executive group for the Service and Technical division decided in September 2010 that they would start to implement Lean. They started to work with the frames and to educate Lean coaches. In April they distributed an A5 poster to all co-workers explaining the attitudes forming the foundation of the Lean house, a short description of what Lean is and a description of their way to success. They also designed a plan of action where they specified 'What' and 'How' they should work with the Lean implementation. A communication plan was designed and distributed in June 2011. The organization was asked whether anyone

wanted to become pilots and be first to start with the Lean implementation and some of the sub-units decided to do this. The pilots started with the Lean training and activities and were intended to be role models for the others. The planned activities are briefly described below.

Planned activities

- Continuous work with the philosophy; (What do we want to accomplish with Lean? What kind of target map/or future position do we want to have? What principles will we proceed from? What will the philosophy imply for the leadership and the co-worker ship? Customer focus. Who are we there for? What needs are we going to satisfy?)
- Communicate the philosophy and how the Lean work is progressing.
- Measure and follow up the Lean improvement work
- Develop the competence of managers and co-workers within Lean
- Create understanding of the costumers' value flow and how our services (processes) support that
- Create a common picture of the present processes and after that create an improved future situation
- Choose what tools and methods we have to learn and use initially
- Visualize the control, follow up and improvement work
- Involve all co-workers within the Lean work
- Train effective team/sections/working groups
- Create possibilities for conscious learning and continuous improvements
- External monitor
- Celebrate success and reward good performance

In the action plan, it is also specified how these activities should be carried out.

Measuring the Lean implementation within a municipal division

The management for the municipal department wanted to measure if their Lean improvement work produced any effect, on a number of different aspects, and they decided to measure before the improvement work started to have a starting point measure. As they saw their Lean implementation as a whole, one aspect they wanted to measure was important values such as leadership commitment and participation of everybody. They also wanted to measure if the co-workers were affected by the improvement work, especially as regards their health. The choice for this measurement fell on the earlier conducted measurement approach which measured health-related Quality Management (Lagrosen et al., 2012). The measuring of the starting points was conducted during the summer of 2011 and it was the Lean coaches who had the responsibility to distribute and collect the measurement approach in the different parts of the organization. That was accomplished at the same time as the ordinary staff meetings at the different sub-units. A total of 397 co-workers filled in the approach which gave a response rate of 79%.

The results from the measuring of the starting points have been divided into the sub-divisions within the municipal department and also compared between pilot groups and others. The results have also been presented to the management.

Starting points for the Lean implementation within a municipal division

The executive board of the Service and Technology Division decided that they wanted to measure if their improvement efforts would have any effect. To be able to do that, they wanted to measure before the Lean activities started. They choose to measure the values; 'Leadership commitment' and 'Participation of everybody' and 'Health' as there was an established measurement approach which measured those values (Lagrosen et.al, 2012) and because they thought that co-worker health was an important area to make improvements increase in the Lean implementation work.

	Empathy	Presence and communication	Integrity	Continuity	Development	Influence	Being informed	Health
Service and Technology	4.60	4.58	4.57	5.08	4.74	5.12	4.62	5.74
Sub units:								
Addera	4.40	4.23	4.13	4.41	4.47	5.14	4.51	5.62
Fastighet	4.01	4.47	3.99	5.12	3.83	4.72	3.95	5.73
Galant	4.89	4.83	4.95	5.56	5.14	5.18	4.90	5.82
Stab	5.42	5.50	5.64	5.71	5.65	5.96	5.00	5.85

Table 1: The result of the starting point measurement.

The table shows the mean value for each dimension of the values 'Leadership commitment' and 'Participation of everybody' and the health index. The measurement gave all dimensions over 4.5 on a seven point Likert scale for the whole municipal divisions. When divided into the sub units there is more fluctuation in the results where the unit Fastighet had the lowest value on all dimensions except 'Presence and communication' and 'Health' whereas Addera had the lowest. The health index had the highest value for all units and that is a common result for this measurement approach, see for instance (Lagrosen et.al, 2012; Bäckström et al, 2012; Åslund et al, 2011).

Some of the units were picked out to be pilots in the Lean implementation and a comparison between these was also presented.

	Empathy	Presence and communication	Integrity	Continuity	Development	Influence	Being informed	Health
Pilots	4.56	4.48	4.56	5.16	4.72	5.14	4.55	5.78
Non pilot	4.57	4.54	4.49	5.00	4.66	5.07	4.64	5.68

Table 2: A comparison between the pilot groups and the others.

The pilot groups have higher results for all dimensions except for the dimensions 'Presence and communication' and 'Being informed', where the non-pilot have higher results.

The municipal unit has now continued their plan of action for implementing Lean for nearly a year and is planning to measure the dimensions once again in September 2012. After that measurement, it will be able to compare and calculate whether the improvement activities have resulted in any effect. The Lean implementation will continue and they will measure several more times. The management is awarded that the implementation is a never-ending process or journey, just as McAdam and Bannister (2001) describe it.

Conclusion and discussion

Due to global competitiveness, managers and organizations have to understand their environment, to satisfy their customers' needs and to continuously anticipate and adapt to the new market rules to be able to guarantee their long-term survival. This increases the demands on organizations to continuously improve the efficiency in the business and improve operational performance. The challenge seems to be the measurement of soft values and this is particularly the case in non-manufacturing organizations, although many authors emphasize the importance of measuring the performance of an improvement project as Lean. It also seems that it is important to have a shared value base if the implementation of an improvement program such as Lean is to be successful. The values and principles should be present in the organization when the journey towards a successful Lean transformation starts. Accordingly the goal for the measurement of soft values can be the values that the managers want to permeate the organization. Many authors also emphasize the importance of measuring before the improvement journey starts, i.e. the starting points. As an improvement work, not is a quick fix but rather a never ending-journey, it is important not to have too high expectations of effects too soon. Earlier measurement with the approach used (Lagrosen et.al, 2012) in this paper also show that, see Figure 1. One of the two lower figures are from the measuring in this case study and the other from the starting points before an improvement work with health promoting activities in eight schools, (Bäckström et. al 2012). Accordingly both from starting points before improvement activities have started. The third figures are from a municipal preschool where the leader has been using Appreciative Leadership in her improvement work for more than 10 years (Åslund et. al 2011). This emphasizes the long-term perspective that is important when improvement work starts. Improvement affects a lot of things in the organization and sometimes it can be hard to see that the effects are due to the improvement work. Then measuring the soft values can be a way of measuring if the organization is on the right way as many authors emphasize shared value as a prerequisite for successful improvement work.

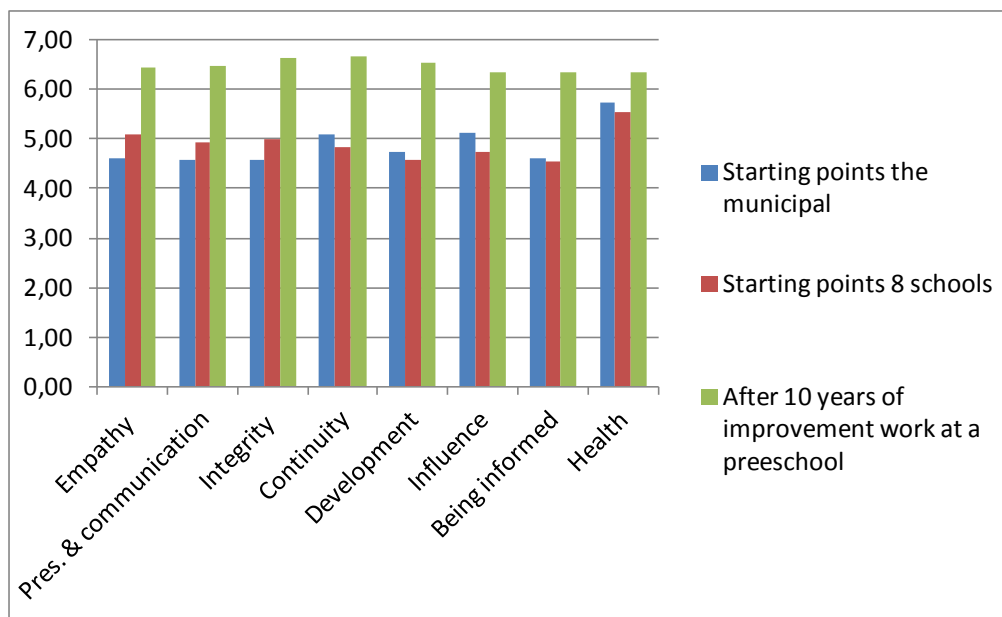


Figure 1: Comparing measurement of starting points and after long-term improvement work.

Further research comparing results from starting points with results after several years of improvement work is needed to investigate if the measurement approach is suitable for this kind of measurement. This study has its limitations as it just has measured the starting points in one municipal unit. The literature study can also be compared with other case studies which measure the effects of improvement work.

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