Is there a relationship between Lean Leaders and healthy co-workers?

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ABSTRACT

Purpose: The purpose of this article is to examine the relationship between Lean values, Lean leadership and perceived co-worker health both from an empirical and theoretical perspective.

Methodology/Approach: A questionnaire used at a Swedish municipality that has been working with quality improvements for 20 years and with Lean for seven years was analyzed. 841 co-workers answered the questionnaire which had been designed and pre-tested to measure the presence of a number of Lean values and Lean leadership as well as self-reported perceived health.

Findings: The results show a moderately positive relationship between Lean values, Lean leadership and co-workers' perceptions of their health. Customer focus presents the highest mean value, the lowest standard deviation and the highest correlation with co-worker health, which is interesting as the investigated organization is a municipality.

Category: Case study

Keywords: co-worker health; culture and values; Lean leadership; Lean values; Quality Management

1 INTRODUCTION

During the last few decades, different management concepts have been used to promote change, health and development towards business excellence, all of which have been said to need a cultural change if they are to be successful and sustained. One management concept that has gained much attention lately is Lean and a prerequisite for the successful application of Lean is changing the culture within the organization (Yamamoto and Bellgran, 2010 and Bhasin and Burcher, 2006). Radnor et al. (2006), state that the public sector also has the same need; the success of Lean depends on organizational and cultural factors. Culture creation and management can be seen as the essence of leadership (Schein, 2004). Managers have great influence on which culture will be predominant in an organization and how the manager acts and behaves influences the attitudes and behaviours of the rest of the employees (ibid.). Leadership as described within Lean is a hands-on and ever-present kind of leadership, where managers are obliged to spend time in operations where customer value is being created, to truly understand what is going on (Liker, 2004). Lean promotes cultural changes by 'doing' rather than formal education and planning (Shook, 2010). According to Dahlgaard and Dahlgaard-Park (2006), Lean production philosophy and the Six Sigma steps are fundamentally the same, and both have been established from the same root: Japanese TQM practices.

Sickness absence causes unwanted costs for organizations and has other negative consequences for individuals and societies, and workplace health has become a major issue for organizations. Poor health not only means suffering for the individuals, it also has implications for their performance in terms of work capacity and productivity (Arnetz, 2005) and increased productivity correlates with increased health (Oxenburgh, Marlow and Oxenburgh, 2004). According to Hughes (2007), work-life balance has a major impact not only on business productivity but also on the economy as a whole. It would seem that health problems are detrimental to productivity as well as to the quality of products and services. Over the last three years, sickness absence in Sweden has increased and is now on the same level as in many other countries in Europe (Swedish Social Insurance Agency 2014).

When measuring organizational effectiveness and success, most measurements have focused on financial figures or other 'hard' measurements such as cost of quality, reduced inventory and delivery dependability (Motwani, 2001; Hansson and Eriksson, 2002 and Hendricks and Singhal, 1999). There is clearly a need for more ways of measuring soft aspects since one notable success factor is changing the organizational culture. Self-reported health has proven to be a valuable indicator of health and it provides useful information for further research. The co-workers' self-reported health has been shown to be correlated to the Leadership Commitment value and has been pointed out as one of the most central values for achieving sustainable health among co-workers. An interesting question is then: do Lean values and Leadership within Lean also promote healthy co-workers?

The purpose of this paper is to examine the relationship between Lean values, Lean leadership and perceived co-worker health, both from an empirical and theoretical perspective.

Lean values

Emiliani et al. (2003) define Lean as a 'management system designed to be responsive to the needs of humans in business and deliver better outcomes for key stakeholders'. When an organization applies Lean, it has a profound effect on the focus the organization will take (Emiliani, 2010). The starting point should always be to benefit the customer and not for internal company reasons (ibid.). After reviewing a number of books on Lean, Bicheno and Holweg (2009) discovered that, out of 25 extracted common themes, the most significant is the external customer. Value is the critical starting point for Lean and value can only be defined by the ultimate customer as the whole offer to the customer, not as optimizing part of the delivery (Womack and Jones, 2003).

The values, principles and techniques of Lean are often depicted as a house or a temple, the foundation of which most often consists of the organization's values. A number of values and principles have been identified by different researchers as the core of Lean (see e.g. Liker, 2004; Womack and Jones, 2003 and Emiliani, 2010). Five principles of Lean were presented by Womack and Jones (2003): specify customer value, identify the value stream, manage the value stream, use a 'pull' mechanism to support flow in the value stream and, finally, when the other four principles are in place, the pursuit of perfection. Liker (2004) describes Lean through 14 principles divided into four parts of a pyramid, the '4 P' model, influenced by Toyota's internal training document, the 'Toyota Way'. In this pyramid, the 4 Ps are, from the bottom up, Philosophy (Long-term thinking), Process (Eliminate waste), People and Partners (Respect, Challenge and Grow them) and Problem Solving (Continuous Improvement and Learning) (Liker, 2004). According to Emiliani (2010), "real Lean" is achieved in an organization when the two main values 'continuous improvement' and 'respect for people' permeate the organization.

Radnor and Walley (2008), in a study carried out in the public sector, identified that all five principles of Lean defined by Womack and Jones (2003) were represented when Lean was applied. However, different sites had different levels of focus on the principles. The focus on the principles was shown as changes in attitudes towards e.g. employee involvement, teamwork and more acceptance among the employees of customer needs (Radnor and Walley, 2008).

Lean leadership

In order to successfully apply Lean, a deep cultural transformation is necessary; something merely implementing Lean tools will never achieve (Liker, 2004). In order to change the culture in an organization, the leadership is of greatest importance (Schein, 2004). Liker (2004) agrees and argues that the managers are

crucial to the outcome of applying Lean. He further states that the manager's role is to change the culture and this is done by being involved in the actual work of identifying waste and mapping value streams. Dombrowski and Mielke (2013) comment that the Lean leader needs to be a role model for his or her employees in order to achieve a better improvement culture. Emiliani (2003) describes Lean leadership as combining both elements from transactional and transformational leadership where the path to competence building is rooted in action learning through kaizen. Leadership capabilities are built through direct observation and participation in continuous improvement activities (ibid). Spear (2004) reflects the values of Lean in four lessons where the fourth is "managers should coach not fix".

After studying five different organizations that had applied Lean, Poksinska, Swartling and Drotz (2013) concluded that they could see a shift in the focus of managerial tasks: from managing processes to developing and coaching people. While studying the influence of leadership when applying Lean in SMEs, Achanga et al. (2006), concluded that leadership includes factors such as having a clear vision, good levels of education and the willingness to support the Lean initiative. Ingelsson (2013) found that leadership described within Lean "appears to be a hands-on and constantly present kind of leadership, where managers are obliged to spend time in operations where customer value is created to truly understand what is going on. In addition, Lean promotes cultural change by 'doing' rather than formal education and planning; focusing on behaviours rather than trying to make people think in a different way" (ibid.).

Looking mainly at service organizations, Seddon (2005) argues that leadership is being able to talk about how the work actually functions with the people who do it. Emiliani and Stec (2005) argue that senior managers need to change a large number of their beliefs, which then needs to result in behaviors that support Lean values. This establishes the basis for wider organizational support of the Lean management system (ibid.).

Co-worker health and Lean

According to Janssen et al. (2003), the occurrence and causes of sickness absence are affected by several factors, many of which are work-related and organizational. Vinberg (2006) claims that there is a connection between improved workplace health and performance and a good working environment and work organization.

Earlier research has shown 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, Bäckström and Wiklund, 2012). The underlying dimension of the 'Leadership Commitment' value regarding the relation to co-worker health was examined by Lagrosen and Bäckström (2005) and Lagrosen, Bäckström and Lagrosen (2010). In this study, it was pointed out that integrity, presence and

communication, empathy and continuity are underlying dimensions of 'Leadership Commitment'. 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).

Hasle et al. (2012) found nine studies that included information about health and well-being and Lean. Seven of these showed primarily negative effects and two showed both negative and positive effects. They state that it seems that the effect is more a result of the implementation process and the context in which Lean is being implemented (ibid.). Conti et al. (2006) found that co-workers' well-being significantly depends on the leaders' choices in designing a Lean initiative. They claim that a Lean initiative is not naturally stressful for the co-workers and is not predetermined to positively affect co-workers' well-being as everything depends on the leader's way of acting (ibid.). A literature review examining the impact of Lean on both musculoskeletal and psychosocial risks shows that harmful results are more evident in the automotive industries and that in, among others, the service sector, the outcome is more balanced (Koukoulaki, 2014). Koukoulaki (2014) further criticizes the view of Lean as being an inherently harmful management system and comments that it has evolved into a system that can have varied effects depending on how it is being implemented as well as on management style.

2 METHODOLOGY

In earlier research, approaches to measuring both co-workers' perceived health and Lean values and Lean leadership have been developed by means of different questionnaires. A questionnaire measuring co-workers' perceived health has been developed and tested by Lagrosen, Bäckström and Wiklund (2012). This questionnaire has been used in several research projects with different purposes to measure co-workers' perceived health, see for instance Bäckström, Eriksson and Lagrosen (2012a); Bäckström et. al, (2012b) and Bäckström, Eriksson and Lagrosen (2014). The other questionnaire aimed at measuring Lean values and Lean leadership has also been tested and used in research projects, see Ingelsson (2013) and Ingelsson and Mårtensson (2014). With those as a basis, a new questionnaire was developed with the purpose of examining if there these areas are linked in any way.

The new questionnaire was compiled with three to five statements for the health index, Lean leadership and Lean values. The calculated variables consisting of three to five statements are as follows:

- Health (3)
- Continuous improvement (4)
- System view (3)

- Customer focus (3)
- Eliminate waste (3)
- Lean Leadership (5)

Long-term thinking was also a Lean value in the questionnaire from the beginning but the tests showed that internal consistency was too low between the statements. Therefore this value was not included in the new questionnaire. Value flow is a common Lean value and in this questionnaire this is covered by the Lean values 'Customer focus' and 'Eliminate waste'.

The Cronbach Alpha was used to calculate the internal consistency within the health index and the variables for Lean leadership and Lean values in this context.

A total of 841 co-workers filled in the questionnaire, which gives a response rate of 70% for the whole municipality and 78% of those present when the questionnaire was handed out. There were seven occasions in the fall of 2013 when the different co-workers were gathered and the questionnaire was handed out and collected by the researchers. The answers were then entered into the statistical program SPSS for further analysis.

The mean score and the standard deviation were calculated for the health index, Lean values and Lean Leadership. Then the first step in studying the relationship between Lean values and the Health index was to draw a scatter plot to check for linearity. This was made to be able to judge the strength of the association between Lean values, Lean leadership and perceived co-worker health. After that, the Pearson Correlation was calculated although the linearity was not clear. We also calculated the Spearman's coefficient of rank correlation between Lean values, Lean leadership and the perceived health of the co-workers.

Case description

A small municipality in southern Sweden with about 15 000 inhabitants was investigated. The municipality was chosen as they have worked with Lean for several years. It employs 1 208 people and their human resources policy is based on the cornerstones of leadership, competence and participation. Back in 1992, the municipality started to work with a common set of values and since 2006, they have focused on Lean. The Fundamentals of Lean for them are:

- Supportive leadership
- Addressing the skills of employees
- Focus on value-adding activities
- Eliminating waste
- A long-term, holistic way of thinking

- Continuous improvement, step by step
- Simple tools
- No scapegoating

In 2013, all co-workers received 70 hours of operational development which was based on the concepts of Professionalism, Co-workership and Customer focus/User focus. In the spring, lectures were held on customer/user orientation and hospitality. During the fall, there was a 40-hour residential course at Pärnu, Estonia, in which 1 074 co-workers and leaders participated and on their return there were follow-ups for each unit.

The sick leave rate for 2013 was 6.3% of the permanent working hours which was an increased rate compared with 2012. The aim is to reduce total sick leave to 3% in 2015. Starting in the fall of 2013, therefore, the municipality has made a concerted effort to reach this aim. A project manager has been appointed for two years to work with the subdivisions. Unfortunately, the sick leave rate for 2014 was 7.2%, which indicates that the aim could be hard to reach.

3 RESULTS

The internal consistency reliability analysis for the health index, Lean leadership and Lean values are presented in Table 1. Health, Eliminating waste, Customer focus and System view were calculated with three statements and they all have a Cronbach Alpha value over 0.65, which can be considered satisfactory. The Continuous improvement value was calculated using four statements and had a Cronbach Alpha value of 0.7, which also can be considered satisfactory. Furthermore, Lean Leadership with a value of 0.82 can be considered satisfactory when five statements have been used.

The mean scores were high on a seven-point agreement scale where the lowest value is Eliminating waste with 4.81 and the highest value is Customer focus with 6.36, which is an interesting result, bearing in mind that it is a municipality that has been measured. It can also be seen as a result of the operational development work which has been carried out which focused on customer/user orientation and a demonstration that their Lean work has been successful.

The scatter plots of Lean values, Lean Leadership and the Health index showed that the strength of association between the variables is not high in any of them.

The Pearson correlation between Lean Leadership, Lean values and the Health index was calculated and the results are presented in Table 2. All correlations are positive varying from 0.339 to 0.231 which can be considered a medium correlation. All Lean values and Lean Leadership have a highly significant correlation with the co-workers' perception of their health but with a large

sample, such as in this case (over 800), even low strength of correlation can be highly statistically significant.

Some argue that it is better to use Spearman's coefficient of rank correlation when the linearity is not so high. Therefore, we also calculated Spearman's coefficient of rank correlation but the values were almost the same as the Pearson Correlation.

Table 1 – Cronbach Alpha, mean and standard deviation for health, Lean leadership and Lean values.

Variable	Cronbach Alpha	Mean	St dev
Health	0.78	5.78	1.00
Eliminating waste	0.69	4.81	1.09
Continuous improvement	0.70	5.05	0.98
Customer focus	0.68	6.36	0.67
Lean Leadership	0.82	5.46	1.03
System view	0.71	5.37	1.10

Table 2 – Correlations between health and Lean leadership and health and Lean values.

Variables	Pearson	Sig.	Spearman	Sig.
Lean Leadership	0.252**	0.000	0.253**	0.000
Eliminating Waste	0.231**	0.000	0.229**	0.000
Customer focus	0.339**	0.000	0.364**	0.000
System view	0.288**	0.000	0.275**	0.000
Continuous improvements	0.290**	0.000	0.261**	0.000

**. Correlation is significant at the 0.01 level (1-tailed).

4 CONCLUSION AND DISCUSSION

All the measured Lean values and the health index had high values when the Cronbach Alpha coefficient was computed. It can thus be concluded that the statements have internal consistency and can be used to measure soft values within an organization. It has actually been pointed out that soft values have been neglected when successful Lean initiatives have been evaluated, and only hard values such as reduction of lead-time, reduction of inventory and cost reduction have been measured (Bhasin and Burcher, 2006). That is also the case when organizational effectiveness and success have been measured, where the focus has also been on hard measurement (Motwani, 2001; Hansson and Eriksson, 2002 and Hendricks and Singhal, 1999). In such cases, the presented way of

measuring can be a complement to hard value measures as both hard and soft measurements should be included when measuring the effects of implementing, for instance, a quality initiative and a culture change (McAdam and Bannister, 2001). The managers have great influence on the cultures which will be predominant in the organization and their actions and behaviour influence the rest of the co-workers (Schein, 2004). With that in mind, it is important to measure the co-workers' perception of how the leaders in the organization behave. The measurement approach used in this research investigates the co-workers' perception of the extent to which the leaders in the organization behave in accordance with Lean Leadership, namely a coaching leadership. Much in the same way as Liker (2004) describes the leadership within Lean; a hands-on and constantly present kind of leadership.

Yamamoto and Bellgran (2010) argue that a prerequisite for a successful application of Lean is changing the culture within the organization. On the other hand, Dahlgaard and Dahlgaard-Park (2006) claim that in Lean production, there seems to be too little focus on understanding the human factor, i.e. how to build the right company culture. Since this was the first time the questionnaire was used at the municipality, we were not able to measure if there has been a culture change, although other measures within the organization and the comments of co-workers and leaders bear witness to that.

Even though the relationships between health and Lean leadership and health and Lean values are not very strong in the empirical study, we can at least conclude that they are all positively correlated. No tendency can be observed showing that the values and leadership have a negative effect on health, which can be seen as an important result. On the other hand, there is no evidence that the variables directly affect each other although there seems to be some relation. This result is similar to that found by Hasle et al. (2012) when they studied health, well-being and Lean. They discovered no distinct casual relationship where Lean affects the working environment and health and well-being but they suggest that it does this in a number of ways. Earlier research has found correlations between co-workers' perception of their health and the Quality Management value Leadership Commitment, see for instance (Lagrosen, Bäckström and Lagrosen 2010; Bäckström, 2009). Leadership Commitment has similarities to Lean Leadership in this research, for instance the aspect of coaching. This could strengthen the assumption that Lean Leadership influences the co-workers' perception of their health in a positive way.

To summarize: in this study we can conclude that the co-workers perceive that they are healthy. However we do not know if this is because of the Lean leader or the Lean improvement work the municipality has done or if it is something else that has had this effect, although we can assume that the quality work has had a positive effect. Next comes the question: do Lean leaders get healthy co-workers? We can answer that they can but there are a lot of other things that also have an influence. The high mean value in the municipality of the co-workers' perceived health, 5.78 on a seven-point scale, is interesting in another respect as

well. They actually have a rather high sick leave rate compared to other organizations and municipalities. This can be explained by the fact that the co-workers who actually filled in the questionnaire perceive that they are healthy which might not the case for the co-workers that were on sick leave.

Customer focus has the strongest effect on health in this study. The knowledge about who the customers are and what a co-worker can do to create value for the customer could affect the sense of pride and job satisfaction. This is in accordance with Emiliani et al. (2003), as they state that a Lean initiative should always have the purpose of benefitting the customer. This is also in line with Bicheno and Holweg (2009), who found that the external customer is the focal point when they examined common themes within Lean. Earlier studies have found correlations between customer focus and co-workers' perceived health (Lagrosen, 2004; Lagrosen, Bäckström and Lagrosen, 2007). Customer focus also had the highest mean value and the lowest standard deviation in the examined municipality. This is very interesting as other studies have shown that customer satisfaction is an absent value in Swedish workplaces (Sverigestudien, 2013). In countries like the U.S., Australia, Canada, Denmark, France and Finland, customer satisfaction is ranked in the top ten corporate values while in Sweden it is ranked in 55:th place (ibid.). In Lean, the value is defined by the end customer and this should be the starting point when implementing Lean (Womack and Jones, 2003). In the municipality examined, customer value is constantly measured. However, in our research, it was only the co-workers' perception of customer focus that was examined. According to Emiliani (2010), an organization can achieve "real Lean¨ when the values 'continuous improvement' and 'respect for people' permeate the organization. In this case the municipality have Continuous improvements as one of their Fundamentals of Lean but they have not specifically mentioned 'respect for people'. In the research, we have seen that the leaders and the co-workers are acting in accordance with 'respect for the people' and the value can therefore be present in the organization. It could also be seen as being represented by their Lean fundamental "no scapegoating".

Investigations on the correlation between co-workers' health and Lean values and Lean Leadership are not so common in research although there are some to be found. Lean has been criticized for influencing the working environment in a negative way. Other investigations have found both negative and positive effects on health and wellbeing (Hasle et al., 2012). This study shows positive correlations between the co-workers' perception of their health and Lean values and Lean Leadership, although they were not very strong. This indicates a need for further research on that relationship and an exploration of what actually influences co-workers' health, an issue which is important for the municipality since the sick leave rate has increased over the last two years.

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